DOCUMENT RESUME

ED 223 370 PS 013 235

AUTHOR Shannon, Albert S., Ed.
TITLE Sex Differences in School Learning.
INSTITUTION Evansville Univ., Ind. School of Education.
PUB DATE 82
NOTE 59p.
PUB TYPE Collected Works - Serials (022) -- Reports - Research/Technical (143) -- Viewpoints (120)
JOURNAL CIT Journal of Children and Youth; Fall 1982.

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS Children; *Communication Skills; *Comprehension; Elementary Education; *Elementary School Students; Listening Comprehension; *Mathematics; Nonverbal Communication; *Reading; Reading Interests; Reading Tests; Self Concept; Sex Bias; *Sex Differences; Sex Stereotypes; Socioeconomic Status; Student Attitudes; Student Teachers; Verbal Communication

ABSTRACT

Sex differences in school learning are examined with a focus on how the variable of gender affects the teaching, learning, development, and behavior of children. The initial entries in this collection of articles focus on reading: the reading interests of girls and boys, sex bias and stereotyping in reading tests, and the influence of gender, sex-role beliefs, and socioeconomic status on listening comprehension. The second section deals with sex differences in the field of mathematics. The combined references of the two articles in this section provide almost 50 opportunities for further reading and research. The third section examines the issues of gender and sex stereotyping. Articles focus on children's understanding of gender, the influence of sex stereotyping in limiting children's play choices, the responses of kindergarten and fourth-grade students to a series of gender-related stories, a "curriculum of self-concept," and the knowledge and attitudes of preservice teachers toward the role of women in society. The final section examines sex differences from the perspective of nonverbal and verbal behaviors, describing sex differences in nonverbal skills and discussing implications for children's developing communicative and social skills. Implications of sex differences in "male and female language" for teachers are also pointed out. (RH)

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JOURNAL OF CHILDREN AND YOUTH

"Sex Differences in School Learning"

Albert S. Shannon, St. Mary's College, Guest Editor

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EDITOR'S CORNER

Today is the tomorrow that you were going to do such a lot about yesterday or has fall become winter without any warning. Tempus fugit. Another way of saying the Journal is late and I apologize. You will also note that the Journal features a 20% reduction in the size of the print which has enabled us to save a few peso's on printing and postage. I hope the size of our print does not add to your already strained eyes as I think you'll find the enclosed articles assembled by Albert Shannon to be most informative. Happy reading.

Carpe diem,

Robert G. Oana, Editor

Introduction

by

Albert J. Shannon
St. Mary's College
Notre Dame, Indiana

It is my pleasure to edit and introduce the current issue of the JOURNAL OF CHILDREN AND YOUTH. The issue is a thematic one dedicated to an examination of sex differences in school learning, with a focus on the examination of how the variable of sex affects the teaching, learning, development and behavior of children.

The introductory entries in this issue focus on sex differences in the field of reading. The Johnson article encourages the practice of basing decisions regarding reading interests and learning on more variables than sex alone. Rowell's contribution presents data to illustrate a need for reading test revision due to sex stereotyping and bias. Negin's data-based examination of the effects of gender, sex-role beliefs and socioeconomic status on listening comprehension concludes the first section of the Journal.

The second section of the current issue deals with sex differences in the field of mathematics. The Sheridan and Becker pieces combine to form a primer on this controversial field. The combined reference sections of the two articles provide almost fifty opportunities for further reading and research.

The next section of the Journal examines the issues of gender and sex stereotyping. Wehren and DeLisi's lead-off article explores the research literature concerned with children's understanding of gender. The Williams and Beeson article that follows presents the thesis that "sex stereotyping limits play choices of children." The study here examines whether or not sex differences existed in play activity. The Vernon entry is a research study comparing the responses of kindergarten and fourth grade students to a series of gender related stories. Emerick adds an innovative "Hexagon of Sex-Role Interaction" as she makes a case for a "curriculum of self concept" in her contribution. The final piece by Gillis and Griffin examines a group of pre-service teachers' knowledge and attitudes towards the role of women in society.

The final section of the Journal examines sex differences from the perspective of non-verbal and verbal behaviors. The Stoddart contribution examines sex differences in non-verbal skills and explores the implications for children's developing communicative and social skills. The Fillmer article explores the area of sex differences in "male and female language," while offering classroom implications for teachers in the schools of today.

This editor is personally grateful to all contributors. I also thank the Committee On Teaching and Learning of Saint Mary's College for awarding release time to permit this editing project to be accomplished. Funds from the Lilly Endowment and support from the aforementioned committee allowed this editor to work the hours of professional time needed to review and edit submissions to the Journal. It was time well spent. I hope the readers concur.

COMING UP

The next issue of the Journal, edited by David L. Tucker of Illinois State focuses on "Reading/Language Arts: Functional Language Use in Schools". These articles deal with: instruction; alternatives; play; losers; games, Engfish, writing trouble; and spelling. Additionally, there will be an article on crisis in science education and college students writing deficiencies.

R.G. Oana

THE READING INTERESTS OF GIRLS AND BOYS

by

Carole Schulte Johnson
Washington State University

With the development of the women's movement during this past decade, several new questions regarding the reading interests of girls and boys have been raised. A review of the literature indicated that studies have addressed the following questions. Are the reading interests of girls and boys different as generally assumed? How does interest affect the comprehension of girls and boys? Does interest depend upon the sex of main character and/or story content? Are their educational effects due to the use of traditional or nontraditional materials?

READING INTERESTS

Over a long period of time the research investigating the reading interests of children suggested that at and beyond age nine, girls and boys have strong divergent interests (King,1967; Lazar, 1937; Norvell, 1958; Terman & Lima, 1925; Thorndike, 1941). However, it should be noted that while some recent studies confirm past research (Chiu, 1973; Elliott & Steinkellner,1979; Tibbetts, 1974) others report no sex difference in reading interests (Conway, 1975; Penney,1977; Rougeau, 1978).

The conflicting findings in recent research may be due to current social changes regarding women. Even so, many of the past studies investigating children's reading interests can be critiqued on the basis of their methodology and interpretations. Often data collection procedures lacked validity and reliability information; e.g., checklists could be completed with minimal thought; answers given to please adults; books checked out did not necessarily mean they were read; and book records could be carelessly kept. In some studies children did not read books but only reacted to titles and/or annotations. Finally, studies often lacked clear definitions and categories (Bleakley, 1977; King, 1967; Weintraub, 1969, 1977; Zimet, 1966).

Regarding interpretation of the results, emphasis has been on the differences, often overlooking the many similarities and overlapping interests of boys and girls. Another virtually ignored finding is the wide variety of interests found within each sex (Asher, 1977; Chiu, 1973; Loracque, 1974; Moray, 1978; Thorndike, 1941; Wolfson, 1960).

INTEREST AND COMPREHENSION

Eleven studies investigated the relationship between interest and comprehension. Four studies, involving fifth through ninth graders, lent support to the claim that interest affects boys' comprehension to a greater extent than it did girls' comprehension. A variety of interest measures were used but only one used reading materials based on individual measures of interest, so perhaps interest was not truly involved. Comprehension was measured by cloze, multiple choice and free response. Support for the claim is not strong. Two studies (Asher & Markell, 1974; Bernstein, 1955) clearly found significance while one reported a trend (Walker, 1976). The last found significance but since it was in a knowledgeable choice format it is possible chat choice rather than or combined with interest was operative (Bowermaster, 1976).

Seven studies did not support the claim of differential effect of interest on comprehension for girls and boys. Subjects were third through sixth graders. Four studies used individually identified interest materials. As comprehension measures, five used the cloze, one used multiple choice and one used both cloze and multiple choice. Only boys were used in one study that found no relationship between interest and comprehension (Brooks, 1971). The other six studies all clearly found that interest affected comprehension similarly for both sexes (Asher, 1975; Asher, Hymel, & Wigfield, 1978; Henry, 1969; Koch, 1974; Saoi, 1976; Schickedanz, 1973). Thus the weight of the research did not substantiate the claim that interest has a greater effect on boys' comprehension than on girls'.

SEX OF CHARACTER/STORY CONTENT

Will girls read about boys and their activities but not vice versa? This question generated investigations of the relationship of protagonist/story content to interest and/or comprehension. One striking aspect of these studies was their recency.

The effect of sex of main character was investigated in four studies. One found that boys did not reject a character solely on the basis of sex but that content, personality and behavior were also important considerations (Frasher, 1977). Two supported the idea that content rather than sex of main character was an important variable (Lovelace, 1980; Scott & Feldman-Summers, 1979). The last concluded that responses to books were not determined by a relationship

between sex of reader and sex of protagonist and that androgenous characteristics did minimize the influence of the character's sex on responses (Coley, 1980).

Three investigations studied the effect of story content. One reported that story preferences were significantly different in only two of ten choices for boys and girls (Rakes, Bowman & Gottfred, 1977). Another concluded that the reader's sex could not be assumed to determine interest or preference (Frasher & Frasher, 1978). The third found a significant sex of reader by category interaction, indicating that girls and boys react differently to some content (Katz, 1979).

The sex of protagonist and story content were studied by three investigations. The first found no significant difference between girls and boys on the cloze score for female or male versions (Klein, 1970). The second reported that setting was significant in determining the interests of boys and that while both sexes liked an action style, girls also liked an introspective one (Yoder, 1977).

Metz (1978) concluded that character role was more important than sex of character for interest, and that the exclusion of nonstereotyped sex roles was detrimental to girls' interests while their inclusion was not detrimental to boys' interests.

None of these studies supported the idea that sex of protagonist is of great import for boys; rather, the research indicated there might be a stronger relationship for girls than for boys. Some did find a same sex preference, but it was not a consistent finding. More important, sex of character appeared not to influence comprehension. Those studies which investigated story content, including two using children's comments, indicated strongly that in children's responses to stories sex of character was less important than content.

TRADITIONAL/NONTRADITIONAL MATERIALS

Studies investigating the effects of various materials on girls and boys were classified into two categories: effects of sex-biased materials and effects of traditional/nontraditional activities. Studies involving career guidance materials were not included.

Eleven studies investigating the effect of sex-biased materials were reviewed. Seven studies of generic usage reported that when traditional generic pronouns and/or nouns were used, the antecedents were more likely to be interpreted as male (Bem & Bem, 1973; Buchanan, 1976; Ernst, 1977; Harrison, 1975; Harrison & Passero, 1975; Kidd, 1971; Schneider & Hacker, 1972).

College students did significantly better on test items containing same sex referents, though there was indication this could also be due to item content (Brown, 1975). Another study reported a trend but no significant difference on tests due to same sex referent passages and items (Moss & Brown, 1979).

Braun (1969) found that both girls and boys retained the same sex interest words better, though the results for girls was compounded by a significant three-way interaction. A critical thinking study suggested that performance was based on the sex interest of the material (Brown & Cook, 1975).

Actual reading materials were involved in eleven studies. One group focused on girl vs. boy content. Groff (1967) found a significant difference between the sexes indicating critical reading was affected by the sex orientation of the material for both sexes. Klein (1970) reported that boys' comprehension did not depend on content but girls' did. In a later study Klein (1979) found that comprehension of the male stories did not differ but that girls' comprehenison of female stories was significantly higher than boys. He also reported that 30 percent of both girls and boys learned more from cross-sex material. He concluded girls might be penalized by not having their interests met.

A second group of studies investigated the effects of traditional and nontraditional roles. One, using preschoolers, reported a higher recognition of nontraditional roles than of traditional ones (Kummerow, 1974). A second found that while both girls and boys significantly preferred the character in a traditional role, they recalled significantly more about the nontraditional character (Jennings, 1975). The final study (Frasher & Frasher, 1978) had nine to twelve-year-olds read stories with characters having the same sex as the reader. Both sexes had significantly higher comprehension of the nontraditional story while girls also preferred it.

Only two studies were found investigating behavioral change. In one, preschoolers who listened to a stereotyped story chose a stereotyped toy significantly more often, while those hearing a nonstereotyped story chose a nonstereotyped toy significantly more often (Ashton, 1978). Scott & Feldman-Summers (1979) used stories with traditional male activities but included a condition where females were the majority of main characters. Both girls' and boys' perceptions of the numbers of girls who could engage in the activity read about was increased significantly in the female majority condition.

A final group of studies was concerned about the effect of sex of main character on comprehension. Although two of the studies (Bleakley, 1977; Frasher & Frasher, 1979) found that both

girls and boys significantly preferred characters of the same sex, three found that the main character's sex did not have a differential effect on the comprehension of girls or boys (Bleakley, 1977; Buchanan, 1976; Klein, 1970). Frasher & Frasher (1979) did find that boys who had read all four stories did have significantly better comprehension when male main characters were used while sex of character did not affect girls' comprehension.

In summary, these studies indicate that: 1) sex bias in educational material can have an effect on children, 2) girl- and boy-interest content do have some effects, and 3) nonstereotyped behavior can be encouraged through use of nonstereotyped books.

The main conclusions based on this review of the literature are:

1. Many studies which found reading interest differences based on sex can be critiqued on the basis of data collection procedures and the instruments used.

2. Girls have a wider variety of reading interests but girls and boys do have many overlapping interests.

3. The research to date does not support the belief that interest has a greater effect on boys' comprehension than on girls'. (Thus there is no basis for a greater representation of males in educational materials.)

4. The idea that girls will read about boys says nothing about girls' preferences or the possible limiting effects of using such materials.

5. Boys will read about girls since the sex of the protagonist is not as important to them as the story content. When the content is not appealing boys reject both female and male main characters.

6. The research suggests that educators should be concerned about the sole use of sex-biased and/or "traditional" materials because of possible educationally harmful effects. Educators should recognize that nontraditional materials can contribute to a wider view of appropriate roles and behaviors.

Overall, these findings suggest that the concern need not be with what boys like and what girls like to read but with what the individual likes. This research supports the inclusion in educational materials of women and men, girls and boys, portrayed in a wide variety of roles and activities, both traditional and nontraditional. Finally, it is unlikely to be accurate, and certainly is not fair to the individual, to base educational decisions regarding reading interests and learning solely on the basis of sex.

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These references continue following reference to Rowell's article on page 11.

SEX BIAS AND STEREOTYPING IN READING TESTS: CHANGE IS NEEDED

by

Elizabeth H. Rowell
Rhode Island College

Reading instruction is highly dependent on assessment measures. Soon after children enter school, they encounter a barrage of reading testing which is likely to continue throughout their school careers. In the kindergarten or early first grade pupils are given reading readiness tests. They then encounter achievement tests which contain a large percentage of reading related items. Individual reading tests are used for diagnostic and placement purposes and in many states reading competency tests are now being used to determine whether students can pass on to a higher grade or receive a high school diploma. These test data are recorded on permanent record cards which are transferred to each school the students attend and the results are used for assessment and placement purposes to sort, select and classify students according to their reading ability. Teachers view the scores and place the students into reading groups accordingly.

The effects of reading tests are most potent on those being tested. Studies indicate that teachers tend to view tests as fairly accurate measures of students' ability and believe that considerable weight should be given to test results (Goslin, 1967). There is also evidence that 80% of school students believe that assessment tests are somewhat accurate (Kirkland,1971). Students are often tracked on the basis of these test scores and their status in school and their self-image, motivation and aspiration can be influenced by testing.

Several questions have been raised about tests in general by the Joint Committee on Testing that can also be levied at reading tests in particular. One includes the concern that finality is too often attached to test scores and that inaccurate testing could therefore foster a narrow conception of ability (Kirkland, 1971). Another question raised in regard to tests concerns the types of items that are used to elicit the skills being examined. Since test outcomes are the result of an interaction between the taker and the test content, it has been conjectured that test content that reflects one group may favor members of that group and may be detrimental to the performance of others (Schmeiser and Ferguson, 1978; Jensen, 1976). If a student does poorly on a test because that person is a member of a group not reflected in the test items or the group is reflected in an unrealistic way, this could be an indication of test bias. All persons who are being tested should be given an equal chance of being successful, regardless of group membership (Linn, 1973). If finality is attached to a score that is inaccurate due to a biased or unfair reading test, the results could be detrimental to the student.

SEX BIAS IN TESTING

Sex bias in testing can refer to the use of a disproportionate number of references to either males or females. The simple presence of an unequal number of references to each of the sexes is evidence of content bias. Another form of bias is the qualitative distinction among the referents that reflects stereotypic oversimplified presentation of males and females such as always picturing males as strong, active and intentional and showing females as weak, emotional, and indecisive.

Reviews of major reading tests suggest that men and women are not presented equally in these tests. Most tests contain an unequal distribution of items between males and females and stereotypic images of both men and women (Dwyer, 1976). Content analyses of reading selections of standardized achievement tests(Donlon, 1978; Tittle, McCarthy and Streckler, 1974; Lockheed-Katz, 1974) and individualized reading tests (Rowell, 1978) indicate that the language of most reading tests is male oriented. With few exceptions each test showed higher frequency of male and female characters, nouns and pronouns. The deletion of the generic use of male terms did not significantly alter the disproportionate male/female ratio. It has also been revealed that children interpret language quite literally. When they see a male pronoun used as a generic term, they generally consider the word to refer to a male character and not as a neutral representative of all persons (Johnson, 1977).

Studies have also shown extreme sex-role stereotyping in reading test items. Women are portrayed as less active than men and boys and are found in fewer occupations. Little mention is made of famous women. In general, males are shown to be strong, more physically active, intelligent, creative, curious, responsible, and more qualified than females. Females are portrayed as followers, excelling primarily at domestic chores and barred from many professions. They are often cast in roles which show them to be more fearful and emotional than males (Tittle, et al, 1974; Rowell, 1978).

The issue has been raised whether girls' scores on reading tests might be enhanced if the male bias of these tests was eliminated. In Donlon's and Rowell's studies this finding was not evident with girls in grades two and three (Donlon, 1973; Rowell, 1980). However, in studies with older students, this question was supported. In a study of 5 & 6 graders by Klein, it was shown that girls scored significantly higher on a test with female main characters than they did when reading about boys. The girls showed a ten percent gain when they were tested on sex-appropriate materials. Although the boys did score somewhat better on a test with male content only, only a negligible difference was found between their scores on male only or female only tests (Klein, 1973).

A similar study by Donlon showed that females in grades 5,8, and 10 tended to do significantly better on items that had more females or neutral figures than on items in which there were male figures only (Donlon et. al, 1979). Brown also found that female students performed better on test items containing female sex referents than on items with male referents or no sex referents (Brown, 1975). Moss's study with undergraduate students also showed that students scored higher when items contained references to their own sex (Moss & Brown, 1979).

INTEREST AND TEST PERFORMANCE

The literature shows that when given a free choice to select reading materials, girls and boys usually choose to read stories about their own sex (Norvell, 1958; Klein, 1970, Ashley, 1970). It has also been ascertained that both boys and girls perform better on high than low interest material (Asher, Humel and Wigfield, 1978). Since both boys and girls seem to prefer to read about themselves, giving children passages of low interest due to sex bias may seriously underestimate some children's ability to gain information from printed materials. Thus, if a disproportionate number of sex biased items were included on a reading test, an advantage might be given to students of that sex and students of the opposite sex might be penalized.

Since female references are much less frequently encountered in reading tests than male references, the fact that girls do somewhat better on items with a greater number of female references cannot be overlooked in considering test fairness. Although tradition appears to suggest that girls can to some extent overcome content selected to appeal to boys, the fact that girls perform more successfully on preferred female content suggests that the inordinate use of predominately male content might violate their best interests and be educationally unsound. The question must be raised that if reading tests were more appealing to girls might their scores be even higher. Concern for meeting girls' interest in test items should be of no less concern than for meeting boys' interest. Failure to do so could give a distorted picture of what girls and boys can do.

The quest for sexual equality has generated a substantial amount of research in recent years. There is a concern that children repeatedly exposed to males and females in stereotypic roles may develop socialization patterns which will only serve to perpetuate these roles. Reading tests have been used extensively in school settings with little thought given to the socializing aspects of their content. It is important to recognize that testing instruments not only assess and measure but can also convey and teach about our culture, prejudices and ways of life. It seems defensible from an ethical point of view to suggest that reading tests present a balanced representation of women and men in test items with respect to both content of occupation, activities and roles and gender forms - male and female nouns and pronouns.

In the past it was argued that it did not matter if reading tests contained primarily male referents as it has been a general research finding that girls are generally better readers than boys. Girls (in the United States) characteristically learn to read earlier, achieve high scores on standardized reading tests and account for a lower percentage of pupils referred for diagnostic testing and remedial reading than do boys (Dwyer, 73). In the past boys made up to 75 to 80% of the disabled readers (Zimet, 1976). However, today there are an increasing number of girls identified who have reading problems (Naiden, 1976).

Girls in the past might have been willing to work hard on a task even though it was uninteresting. However, it must be recognized that the changing definitions of sex-roles are leading many girls to be less oriented toward meeting external standards and more concerned with internal criteria such as their interest in a task. Reading tests that can give an accurate indication of girls' reading ability must be utilized.

Reading tests which are biased may act to reinforce sex role stereotypes and possibly underpredict or overpredict scores systematically. If reading tests contained a more equitable, less stereotyped balance of male and female items, both boys and girls might benefit from more valid measurements of their reading ability.

Efforts should be taken to develop and administer fair reading tests for both males and females. The following are suggestions for coping with sex bias and stereotyping in reading tests.

SUGGESTIONS FOR COPING WITH SEX BIAS AND STEROTYPING IN READING TESTS

1. Scrutinize the reading tests you are currently using for sex bias and stereotyping. Tests should be constructed of items which contain either no sex references or a balance of male and female references. The status of males and females within the test should be equal and the content of items should not present only traditional or stereotyped images of men and women. A test can be reviewed for evidence of sex bias or stereotyping or the following check list could be used.

Checklist for Sex Bias and Sterotyping in Tests

	MALE(S)	FEMALE(S)	NEUTER	BOTH
a. Number of test items where main character(s) is (are)	_____	_____	_____	____
b. Number of items where references are made to	_____	_____	_____	____
c. Number of test items with illustrations to:	_____	_____	_____	____
d. Number of test item in which children are mentioned or shown as:				
acti e	_____	_____	_____	____
watching or sitting	_____	_____	_____	____
using initiative	_____	_____	_____	____
passive	_____	_____	_____	____
independent	_____	_____	_____	____
dependent	_____	_____	_____	____
courageous & heroic	_____	_____	_____	____
fearful or helpless	_____	_____	_____	____
giving help	_____	_____	_____	____
receiving help	_____	_____	_____	____
e. Number of test items in which adults are mentioned or shown				
in different occupations	_____	_____	_____	____
playing with children	_____	_____	_____	____
taking children on outings	_____	_____	_____	____
being helpful	_____	_____	_____	____
receiving help	_____	_____	_____	____
courageous or heroic	_____	_____	_____	____
fearful or helpless	_____	_____	_____	____
famous personalities	_____	_____	_____	____
f. Is the male term frequently used as a generic?			Yes	No
g. Are any derogatory comments directed at girls in general?			Yes	No
h. Are any derogatory comments directed at boys in general?			Yes	No
i. Does the test appear to be interesting to both boys and girls?			Yes	No

2. Be constantly on the alert for better nonsexist reading tests. Before purchasing a new group or individual test, obtain a specimen copy and scrutinize it with regard to the Checklist for Sex Stereotyping and Bias in Tests.

3. If required to use a sexist test, talk with the students about the selections they found to be difficult. If it appears that a failure on an item might have been due to biased test content, give students an equivalent but nonsexist selection to read. When recording the data, report the scores and reactions to both selections. If a nonsexist selection is not available, discuss the problem with the students and urge them to do their best even though the selection is not appealing to them so that you will know better how to help them with their reading.

4. When using a commercial individual reading test, it is often possible to rewrite test items by changing male to female referents. The Spache or the Dale-Chall readability formulas with their list of easy words can be used to measure the difficulty of both the original and the modified passages. If students appear to react negatively to the sex bias of stereotyping in the original instruments, test them on the modified versions. Since the reliability for the modified version has not been established, it is important to state that a modified version of the test was used.

5. When making reading tests of any kind, be careful to include an equal number of male and female items and to avoid stereotypic roles.

6. Eliminate sexism in language in teacher-made reading tests. Instead of using male pronouns as generic terms to refer to both sexes, use plural terms or the phrases "he or she", "him or her", "his or her".

examples:

A student needs to take good care of his books.

changed to

A student needs to take good care of his/her books.

or

Students need to take good care of their books.

7. Inform publishers about sex bias and sex stereotyping in commercial reading tests. Write letters to publishers giving specific examples of sex bias and stereotyping and suggest a need for improvement. Publishers will eventually respond to the public if enough pressure is given.

8. When making an informal reading inventory based on books used in the school, include an equal balance of male and female selections. Choosing selections which contain both male and female characters will better give an indication as to the students' ability to read this material.

9. Continue to use either teacher-made or commercially produced reading tests. Although tests can be improved by eliminating sex bias and stereotyping they still represent an important source of information about students' reading abilities and difficulties. However, care should be taken not to attack finality to scores of tests that appear to be highly biased.

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THE EFFECTS OF THE GENDER, SEX ROLE BELIEFS, AND SOCIOECONOMIC STATUS ON LISTENING COMPREHENSION

by

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Sex role beliefs greatly influence a person's life. Sex role beliefs may affect a person's personality development, creativity, career choice, and marital harmony (Duncan, Featherman, & Duncan, 1972; Ellis & Bentler, 1973; Morell, 1979). It is easy to understand the possible consequences of restrictive sex role stereotypes which traditionally assign the qualities of efficiency, bravery, and intelligence to men and the qualities of passivity, dependence, and unpredictability to women (Broverman, Vogel, Broverman, Clarkson, and Rosenkrantz, 1972; Kohlberg, 1966). When women succeed, their accomplishments are perceived by traditionalists as inappropriate behavior (Feather & Simon, 1975) and are devalued (Deaux & Emswiller, 1974).

Little is known concerning how and when a child acquires sex role beliefs. However, a popular theory is that a child acquires sex role beliefs at an early age through direct and vicarious social experiences, such as experiences with parents (Scanzoni, 1975), significant others, and the media (Mischel, 1970). To avoid social isolation children will suppress behavior that deviates significantly from sex role norms, and will avoid or reject situations which encourage deviance (Zimet, 1976). In accord with this social learning theory, it can be assumed that differences in sex role beliefs are influenced by socioeconomic status (Hall & Keith, 1964). For example, people with more education, typically members of a high socioeconomic group, may hold less traditional sex role beliefs because of their broader experiences than members of a low socioeconomic group (Scanzoni, 1975). These beliefs, of course, would be conveyed from parents to children. Socioeconomic status may also have an impact on the locus of authority in the home, feelings of financial responsibility, occupational aspirations, and social opportunities. One purpose of the present study was to investigate possible differences in the sex role beliefs of kindergarten students from different socioeconomic backgrounds.

A second purpose of the present study was to investigate whether story protagonists portrayed in traditional and untraditional sex roles would affect the listening comprehension of kindergarten students. While children at the age of three recognize that there are appropriate activities and objects for each sex (Kohlberg, 1966; McCandless & Evans, 1973; Thompson, 1975), this investigation explored the existence of sex role beliefs among kindergarten students and the question of whether those beliefs were strong enough to influence listening comprehension. Jennings (1975), in a similar study, found that preschool children of both sexes preferred a story in which the protagonist was portrayed in a traditional sex role over a protagonist in an untraditional role. However, the subjects had higher listening comprehension scores for the story with the untraditional protagonist. Studies (Asher & Markell, 1974; Bleakley, 1977; Frasher & Frasher, 1978, 1979) investigating the relationship between interest and the reading comprehension of older elementary school students have produced conflicting results. There is no conclusive proof that males or females always prefer one story over another or that students' preferences will affect their comprehension.

Hypotheses

The following hypotheses were tested:

H_1: There is no significant difference between the listening comprehension scores of male and female kindergarten subjects.

H_2: There is no significant difference between the listening comprehension scores of high socioeconomic and low socioeconomic groups

H_3: There is no significant difference between the listening comprehension scores of a student on a story with a protagonist in a traditional sex role and on a story with a protagonist in an untraditional sex role.

H_4: No significant interactions will occur among the variables of sex, socioeconomic status, and protagonist role.

H_5: Preference for a traditional or untraditional sex role is independent of the sex of the subject.

H_6: Preference for a traditional or untraditional sex role is independent of socioeconomic status.

H_7: The choice of appropriate sex rolesfor men and women is independent of the sex of the subject.

H_8: The choice of appropriate sex roles is independent of socioeconomic status.

Methods

Subjects

Eighty-three subjects were selected from two elementary schools in Kenosha, Wisconsin. One school was in a low socioeconomic area and the other was located in a high socioeconomic area.

The total number of families on general welfare or receiving aid to dependent children in the low socioeconomic area was well above the city average of 12 percent. Half of the families represented in the kindergarten classes received some type of financial assistance. The average annual income for a family of four was below $14,900.

None of the families in the kindergarten classes of the elementary school in the high socioeconomic area received financial aid. The average annual income for a family of four was above $35,000. The majority of the household heads were white collar workers.

Kindergarten students who scored within one standard deviation of the mean on the listening comprehension subtest of the California Achievement Test, Form C, were selected for use in the study. The California Achievement Test was selected because of its high technical quality, the appropriateness of the norm groups, and its convenient administration and scoring procedures.

Materials

Shortened versions of two stories were selected: My Dentist by Harlow Rockwell and I Want to be a Ballet Dancer by Carla Greene. The stories depict people performing in prestigious occupations. Both stories were similar in length, format, and literary style. My Dentist was chosen for its traditionally male sex role. I Want to be a Ballet Dancer was chosen since it portrays a female in a traditional sex role. This story was altered slightly so the protagonist was portrayed as an adult, rather than as a child. As a result, both stories contained adult protagonists. The difficulty of the two selections was deemed appropriate by four classroom teachers, the primary investigator, and the performance of a pilot group.

A second set of stories, portraying the protagonists in untraditional sex roles, was prepared by reversing the sexes of the protagonists in My Dentist and I Want to be a Ballet Dancer. The dentist became a woman and the ballet dancer became a man.

Eight multiple choice comprehension questions were written for each of the two stories. Questions were taken from the literal, inferential, and critical levels. The critical judgment question for each story asked the subject to choose a man or a woman as the best person for the job. The critical judgment questions served as a measure of sex role beliefs. After the questions for the second story were answered, students were immediately and individually interviewed so that they could elaborate on the reasons for their responses to the critical judgment questions. These responses were tape recorded since it was thought that insights could be gained from them.

One preference question was written to be asked at the conclusion of the treatment. The question, "Would you rather be a dentist or a ballet dance?", indicated the students' comparative interest in the two occupations.

Simple answer sheets were designed and duplicated.

Procedure

Four investigators, two male and two female college students, were trained in reading stories, asking questions, and recording comments. The training was divided into four parts: 1) establishing rapport with the subjects, 2) reading a story without projection bias, 3) asking questions without influencing the answers, and 4) using a tape recorder. Trainees practiced with a pilot group drawn from a different city that consisted of 10 low socioeconomic status students and 10 high socioeconomic status students who had scored at grade level on the listening subtest of the California Achievement Test. Subjects in the pilot given were not used in the actual study.

The actual study was undertaken near the beginning of the school year so that the sex role beliefs of students could not be greatly influenced by the characteristics or actions of their teachers or the classroom environments. In the study, students were screened with the listening subtest of the California Achievement Test, Level C, which was administered by a reading specialist.

One week after the screening, students were treated in sections of five to reduce behavioral difficulties and increase attention. The sex of the investigators was matched with the sex of his/her respective sections. This was done to discourage any urge to respond in order to please the investigator.

One half of the males heard the story My Dentist, then answered the eight oral comprehension questions by marking their answer sheets. The males next heard I Want to be a Ballet Dancer, answered the appropriate questions, and answered the preference question. The protagonists in the stories were men, as were the investigators. Each session took approximately 25 minutes. The procedure for the remaining half of the males was identical, except that the order of the stories was reversed.

One half of the females heard the story I Want to be a Ballet Dancer, then answered the eight oral comprehension questions by marking their answer sheets. The females next heard My Dentist, answered the appropriate questions, and answered the preference question. The protagonists in the stories were women, as were the investigators. The procedure for the remaining half of the females was identical, except that the order of the stories was reversed.

All responses were obtained within a five-day period. Each correct response on the comprehension tests was given a value of one point, for a possible total of eight points per story. All of the scoring was done by the primary investigator. Twenty-five percent of the answer sheets were rechecked to verify scoring accuracy. No mistakes were found.

Design and Analyses

A 2x2x2 repeated measures design and analysis of variance techniques were selected to examine the listening comprehension scores. The first between variable was gender, sex of the subject. Two levels, male and female, were chosen. The second between variable was socioeconomic status. High and low socioeconomic levels were selected. The third variable, the within variable, was the role of the protagonist. Two levels, traditional role and untraditional role, were chosen.

To create proportional cells, 12 of the original 83 subjects were eliminated. The 12 were randomly extracted from the group of high socioeconomic males.

Chi-square tests, corrected for continuity, were used to compare the influences of gender and socioeconomic status on subjects' responses to the two critical judgment questions and to the preference question.

A. .05 level of significance was chosen for testing all hypotheses.

Results

Table 1 reports the cell means and standard deviations for the listening comprehension scores.

Table 1

Cell Means and Standard Deviations

		Traditional		Untraditional	
	n	$\bar{X}$	sd	$\bar{X}$	sd
Male					
Low SES	20	4.950	.887	3.750	.657
High SES	16	4.813	.958	3.438	.629
Female					
Low SES	19	5.105	1.696	5.684	1.335
High SES	16	4.813	1.047	6.313	.793

Table 2 reports the analysis of variance using a student's comprehension performance as the dependent variable.

Table 2

Analysis of Variance

SV	df	SS	MS	F
Between S's				
Gender (B)	1	52.952	52.952	29.5514*
SES (C)	1	.008	.008	.0046
B x C	1	1.381	1.381	.7705
Between error	67	120.054	1.792	
Within S's				
Protagonist role (A)	1	.852	.852	1.8545
A x B	1	46.037	46.037	100.1745*
A x C	1	1.377	1.377	2.9961
A x B x C	1	2.443	2.443	5.3168*
Within error	67	30.797	.460	

*Significant, $p < .05$.

Hypothesis 1 was rejected, since gender was found to be a significant main effect, with females outperforming males. Hypotheses 2 and 3 were accepted, since neither socioeconomic status, nor protagonist role, proved to be a significant main effect.

Two interactions proved to be significant. The first, the interaction between protagonist role and gender, revealed that males and females performed similarly with the traditional story, but differently with the untraditional story. The comprehension scores of males decreased with the untraditional story, while the comprehension scores of the females increased. This finding partially conflicts with Jennings (1975), who found that listening comprehension was higher for both male and female subjects on an untraditional story. The second significant interaction was between socioeconomic status protagonist role, and gender.

Table 3 reports the preferences that were expressed by the students when they answered the question, "Would you rather be a dentist or a ballet dancer?" Subjects chose between traditional and untraditional roles.

Table 3

Sex Role Preference

Group	Traditional	Untraditional
Male		
Low SES	19	1
High SES	14	2
Female		
Low SES	14	5
High SES	14	2

The hypothesis (H_5) that preference for a traditional or untraditional sex role is independent of the sex of the subject was accepted ($X^2 = .0699$). Males and females both preferred traditional sex roles. Preference influenced the comprehension of males and females differently. Male subjects preferred the traditional role and their listening comprehension scores were higher on the traditional story. Female students also preferred the traditional role, yet their comprehension was lower on the traditional story. Preference, therefore, positively influenced the comprehension of males, but negatively influenced the comprehension of females.

The hypothesis (H_6) that preference for a traditional or untraditional sex role is independent of socioeconomic status was accepted ($X^2 = .00002$). Subjects, regardless of their socioeconomic status, preferred the traditional sex roles. The results of this study are consistent when preference and comprehension are compared. Both socioeconomic groups comprehended similarly. Significance was not reached either for the main effect of socioeconomic status or for the interaction of socioeconomic status and protagonist role.

In regard to critical judgment, the subjects chose the most appropriate sexes for the jobs of dentist and ballet dancer. Based on the combined answers to the two critical judgment questions, as reported in Table 4, two hypotheses concerned with the choice of appropriate sex roles were examined.

Table 4

Combined Responses to the Critical Judgment Questions

Group	Traditional	Untraditional
Male		
Low SES	34	6
High SES	23	9
Female		
Low SES	22	16
High SES	24	8

The hypothesis (H_7) that choice of appropriate sex roles is independent of the sex of the subject was accepted ($X^2 = 2.584$). Males and females both felt that people in traditional sex roles would perform the best. The hypothesis (H_8) that choice of appropriate sex roles is independent of socioeconomic status was accepted ($X^2 = .00086$). Both socioeconomic groups felt that people in traditional sex roles would perform the best.

In addition to the tests that were run with the combined responses, the answers to the two critical judgment questions were analyzed separately. Table 5 reports the responses to the question, "Who would be a better dentist, a man or a woman?"

Table 5

Responses to Critical Question One

Group	Man	Woman
Male		
Low SES	16	4
High SES	12	4
Female		
Low SES	10	9
High SES	8	8

A hypothesis that choice of appropriate sex roles is independent of the sex of the subject was rejected ($X^2 = 4.3076$, $p < .05$). Males generally stated that a man would be a better dentist, while the females were divided almost equally between their choices of a man or a woman.

A hypothesis that the choice of appropriate sex roles is independent of socioeconomic status was accepted. Both socioeconomic groups felt that a male would be a better dentist.

Responses to the second critical judgment question, "Who would be a better ballet dancer, a man or a woman?," are reported in Table 6.

Table 6

Responses to Critical Question Two

Group	Man	Woman
Male		
Low SES	2	18
High SES	5	11
Female		
Low SES	7	12
High SES	0	16

A hypothesis that choice of appropriate sex roles is independent of the sex of the subject was accepted ($X^2 = .0574$). Males and females both felt that a women would be a better ballet dancer.

A hypothesis that choice of appropriate sex roles is independent of socioeconomic status was accepted ($X^2 = .2357$). Both socioeconomic groups felt that a woman would be a better ballet

Discussion

No differences were found between the high socioeconomic status group and the low socioeconomic status group. Both groups chose and preferred traditional sex roles, and comprehended similarly. One explanation for these surprising findings is that the differences in the definitions of the two groups may not have been radical enough.

Males and females in the present study stated that they would prefer to be in an occupation that represented traditional sex roles. Given two choices, males typically wanted to be dentists and females wanted to be ballet dancers. The students also felt that people in traditional sex roles would perform the best. This preference for and confidence in traditional sex roles, however, had a mixed effect on listening comprehension. Overall, females outperformed males in listening comprehension, with most of the difference being due to the wide gap between their performances with the untraditional story. The performance of males was more adversely affected by sex role beliefs than the performance of females. The comprehension scores of males decreased with the untraditional story, while the comprehension scores of females increased. This finding seems reasonable when the responses of the students to the two critical judgment questions regarding appropriate sex roles are considered. It was easier for females to accept a traditionally masculine role than it was for males to accept a traditionally feminine role. These responses are consistent with the demands of modern society. Society exerts little pressure for men to explore or pursue traditionally feminine sex roles, while it is more acceptable for a woman to assume masculine roles. Many people feel that a woman assuming a traditionally masculine roles would have the admirable qualities of assertiveness, independence, and daring; while a man in a traditionally feminine role would show the unenviable qualities of passivity, dependence, and fearfulness.

The results of the present study indicate that kindergarten students hold definite sex role beliefs which are strong enough to affect listening comprehension. As a result, teachers must be sensitive to sex role beliefs, particularly those of males, when selecting stories to read to kindergarten students.

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MATH ACHIEVEMENT AND PARTICIPATION: A REVIEW OF RESEARCH RELATED TO SEX DIFFERENCES AND STEREOTYPES

by

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There are wide differences in the mathematical ability of males and females by adulthood. As a result of their lack of participation in higher level math courses in high school and college, females are automatically excluded from a wide range of high paying occupations requiring mathematical competence. For some time, researchers have investigated the origins of these sex differences in math achievement.

Burton (1978) proposed three hypotheses that explained sex differences in mathematical achievement: 1) biological differences such as spatial ability as a partial explanation of the differences between boys and girls, 2) cultural pressures which encourage boys in mathematics and discourage girls from entering this male domain, and 3) sex role identification affecting persistance on choices that are felt to be more appropriate for one or another sex.

A National Assessment of Achievement and Participation of Women in Mathematics (1979) study found certain variables related to participation in math. These included a positive attitude toward math, the perceived usefulness of math in future career plans, and the influence of parents, teachers and counselors. An attempt will be made to review some of the pertinent studies related to those factors which affect achievement and participation in mathematics.

Factors Affecting Math Achievement

Fennema and Sherman (1977b) studied the mathematics achievement of 9-12th graders controlling for number of mathematics courses and general ability. They investigated sex-related differences in achievement, spatial visualization and affective factors among high school students. Males in general rated math as a male domain more than girls, took more math and space related courses and engaged in more mathematical activities outside of school. Females reported that perceptions of their parents' attitude toward them was less positive than that of males' parents in mathematics achievement and perceived math as less useful than males outside of school. Affective variables were more highly related to achievement for girls than boys.

In a subsequent study with junior high students, Fennema and Sherman (1978) investigated sex-related differences in math achievement and cognitive and affective variables. Males were found significantly more likely to be confident in math and label math as a male domain than females. No sex related differences were found in verbal ability, spatial visualization, and both lower and higher level cognitive tasks. Males also perceived more positive attitudes than females from their parents towards their achievement in math, and math as more useful. In respect to parent perception and teacher positive perception as learners, this difference became significant at the high school level. Fennema and Sherman attributed the difference between these results and popular belief as due to the confusion of comparing males and females of different mathematical backgrounds and ability.

Schratz (1978) investigated sex differences in mathematical and spatial skills in three ethnic groups: black, Hispanic and white. Entire classes of third, fourth, fifth and sixth grades were used. Results supported the theory of the influence of cultural factors in the development of sex differences in cognitive skills as well as supporting the idea that adolescence was the period during which sex differences emerged.

Math Achievement

Mullis (1975) reported the results of the National Assessment of Educational Progress in math achievement at age levels 9, 13, and adulthood. Her report of the findings indicated that mathematics achievement was nearly equal at age nine among boys and girls while at the adult level there were large differences in the performance of males and females with males exceeding the performance of females. In a criticism of Mullis' report, Fennema and Sherman (1977a) pointed out that while males performed better than females at age 17 and adulthood, when educational and mathematical backgrounds were similar, males and females achieved similarly.

Due to the almost identical student decline in math skills from 1973 to 1978 in the National Assessment of Educational Progress in math achievement, sex differences between males and females have remained about the same at the 9, 13 and 17 year old levels (Ward, 1979).

The National Assessment of Achievement and Participation of Women in Mathematics (1979) drew on the NAEP data as well as using other measures finding little sex difference in achievement in math at age 13. This study of over 3200 thirteen year olds and seniors found no support for the idea that males are superior in spatial visualization. Girls exceeded boys in this at age 13, and no sex differences were found by senior year. Contrary to the Fennema and Sherman (1977a) findings, the Women in Math study did find differences in problem solving even when course taking was controlled, although this was not so at the highest course-taking levels--pre-calculus and calculus.

Tests and Testing

It may be that some of the differences in achievement in mathematics can be accounted for by the nature of the tests themselves. Stein, Pohly and Mueller (1971) introduced three tests to sixth graders as either masculine, feminine or neutral in orientation. They found that girls scored equally well on feminine and neutral tests but significantly lower on the masculine test.

Christopolos and Borden (1978) investigated the effects of sex-stereotyped content on the verbal problem-solving scores of first graders. While total scores on sex stereotyped problems did not differ, girls performed significantly better on female oriented questions. These results indicated that sex role orientation had an effect on the ability of the girls in the study. In both the 1973 and 1978 National Assessment of Mathematics, girls tended to outperform boys on pure computational items while males did better on word problems. On the National Assessment of Educational Progress in Reading, boys read better than girls generally on tests which dealt with male-oriented content concerned with reading signs, charts and forms (Herman, 1975; A National Assessment of Achievement and Participation of Women in Mathematics, 1979).

Math as a Male Domain

It appears that the perception of mathematics as a male domain may effect female achievement in this area. Fennema and Sherman's studies found that at both the junior and senior high level math was rated as a male domain, with less female confidence in this area. They emphasized that the societal stereotyping of math as masculine may result in females not achieving as well as they could if it were perceived as a "non-male domain."

Stereotyping of math as a male domain appears to be independent of preference for the subject at least in elementary school. Haladyna and Thomas report (1979) that before grade six, there are little of any differences in attitudes towards math. Other studies suggest that by grade nine differences become more pronounced with significantly poorer attitudes among females (Aiken, 1976; Norman, 1977). Ernest (1976) proposed that it was not the liking of math which was the factor that encouraged boys to study math more than girls as it was the sex role expectations related to math achievement.

In her research, Brush (1980) discussed some of the causes for math anxiety and avoidance. She stated that girls consistently perceived mathematics as much more difficult than did boys, felt they lacked the ability to do math, and had negative attitudes toward math. Girls also saw less usefulness of math for their future careers. Brush suggested that the social milieu discouraged girls from further study of mathematics because of its stereotype as a male domain. The Women in Math Study found women more anxious about math and that this did affect their participation in math classes.

Carpenter et. al (1980a, 1980b) reported the results of attitude measures administered to 9, 13 and 17 year olds during the 1977-78 mathematics assessment of the NAEP. At age 9, two-thirds of boys and girls disagreed with the statement that math was more for boys than girls. For 13 and 17 year olds, about 90% of boys and girls disagreed. The Women in Math study reported low or insignificant correlations of participation in math with most stereotyping measures. The stereotyping of math as a male domain was not found to be a dominant factor affecting participation in math, but women were more likely to take advanced courses if they believed math appropriate for both sexes. This was particularly so among senior women.

Preece (1979) conducted a study on math ability and related factors among 1200 students in British secondary schools for second year students. While there were not pronounced differences in mathematics ability, female attitudes toward math were deteriorating. Females also perceived less positive attitudes towards their achievement in math from others.

Sex Role Standards and Achievement

In a number of studies which investigated achievement stereotypes, students perceive sex stereotypes related to achievement which differed from reality. Sheridan and Kaminski (1981) found children in grades two through six perceived boys as smarter in math. When the math achievement scores for all third and sixth graders in the same schools were examined, no sex differences were found in math concepts. At the third grade level males were significantly higher in computation skills, but by sixth grade, females had a slight edge. These students' perceptions of sex differences in math for the most part preceeded any real differences (Sheridan and Short, 1982).

Dwyer (1974) found that sex role standards for elementary and secondary school age students also contribute significantly to the variance in reading and math achievement scores. The effects were stronger for boys than girls and strongest at grades six and above. These sex stereotyped perceptions increased with age and were stronger in reading than in math.

The stereotype of reading and math as more appropriate for one sex or the other is related to the perception of the subject as either masculine or feminine. Stein and Smithells (1969) measured the sex role standards about achievement among boys and girls in grades 2, 6 and 12. Students rated reading as feminine and arithmetic as masculine; the older the students the more extreme the ratings. Stein (1971) then investigated the sex role standards of six achievement areas. Again reading received consistent, though small feminine ratings; and math was the least sex-typed area although it was perceived as more masculine than feminine.

Social Factors

Molros and Koff (1978) also investigated the hypothesis that sex related achievement in reading and math become established among fifth and sixth graders before the actual sex differences in these academic areas emerged. Their findings suggested that girls who were better readers were better liked if they were more successful in math. Both boys and girls agreed with this perception, though boys were more likely to believe boys would not like a girl who did well in math.

Fox (1976) states that is is likely that in addition to the stereotyping of math as a male domain, there are other explanations for sex differences in math such as differential course taking and the lack of support for girls from significant people in their lives. Other social factors include the absence of role models for women mathematicians and the presence of negative stereotypes for women and girls gifted in math.

When Luchins (1979) asked mathematicians at professional meetings to name outstanding women mathematicians, fewer women than men could do so. Luchins also reported that more women mathematicians recalled being discouraged in their studies by family and friends than did males. Women interviewed told of differential treatment as math students and as professionals at all levels of training and employment.

Teacher and Parent Attitudes

It is possible that if students perceive that teachers and parents expect less achievement in math from girls than boys, this becomes a self-fulfilling prophesy. When elementary and high school teachers were asked who did better in English and math, of those reporting sex differences, 63% of the teachers reported girls in English, none reported boys; and 41% of the teachers reported boys did better in math, none reported girls (Ernest, 1976).

Fox (1976) reports that parental expectations for girls in math are lower than for boys, with parents more accepting of lower levels of achievement in their daughters. Beginning in sixth grade, students reported that mother helped more than father with homework in general, but father "becomes the authority on mathematics and continues this role through high school" (Ernest, 1976, p 596).

At both junior and senior high levels, girls report that their parents' attitude toward them is less positive in math achievement than boys. The effect of positive parent and teacher perception of girls in math achievement becomes significant at the high school level and these variables affect girls much more than boys (Fennema and Sherman, 1977b; 1978).

Conclusions

Cultural and sex role hypotheses take on particular importance in the case of mathematics which is more dependent on direct instruction and specialized study. The gap in math ability appears during adolescence when strong sexual identity is developing and strong social pressures to conform to the perceived sex role may contribute to the proportionately fewer number of females than males who do not elect higher math courses.

There appears to be some evidence, however, that the past decade of research has seen some changes. The Women in Math study found no sex differences in the participation of women in General Math, Algebra I and Geometry courses though sex differences in favor of males occurred in Algebra II and Statistics. This finding differs from earlier studies of greater sex differences in the participation of males and females in math courses. To some extent it appears that sex differences in math have changed in the past decade. As girls and women strive for occupations outside the traditional female ones, the importance of higher math courses becomes obvious. Time alone may reveal even more about the inevitable nature/nurture controversy of sex differences in math achievement.

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SEX DIFFERENCES IN MATHEMATICS

by

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No discussion of sex differences in school learning is complete without a consideration of the field of mathematics. Publicity within the last year in the mass media may have left many lay people, and professionals without much background in mathematics, confused about the abilities of males and females in mathematics.

Much of this publicity has arisen from an article in Science (Benbow & Stanley, 1980) which discussed the large differences in favor of males in administrations of the Scholastic Aptitude Test - Mathematics to very gifted students, primarily in grades seven and eight. The sex differences found in this very special population are undeniable; what is problematic are the interpretations of, and conclusions drawn from, the original study. (See letters in Science, vol. 212 (April 1981) for discussion of these issues.)

What do we know about the achievement of females and males in mathematics? Sex differences in mathematics achievement have received increased study in the last decade or so. Some of the newest data available come from the most recent National Assessment of Educational Progress (Fennema & Carpenter, 1981) and other large scale studies. In general, these data show that there are no sex-related differences in performance in mathematics in the elementary and middle school years. Studies of high school students need to control the amount of mathematics studied, because males generally have studied more than females. When that is done, sex differences do not show up consistently, but when they do, they tend to favor males, especially in problem solving or higher level cognitive skills (Armstrong, 1980; Fennema & Carpenter, 1981; Fennema & Sherman, 1977, 1978). We can say rather definitively that boys and girls learn mathematics to a comparable extent in elementary school. However, sex differences found in later years raise questions about the mathematical foundation laid in the early years of schooling, and how that may relate to differences which show up later.

And there are other reasons to be concerned about the mathematical experiences of boys and girls in school. Mathematics has been linked to the occupational segregation that continues in our society (Sells, 1973). A look at various occupations shows that men continue to dominate such highpaying technical and professional fields as computer science, engineering, the physical sciences, and medicine (Bureau of the Census, 1980). Such fields are heavily dependent on mathematical competence; a major barrier to women to enter or advance in these fields is a lack of the requisite mathematical skills caused by inadequate preparation.

Recent data on the participation of women in high school mathematics courses show that young women continue to take fewer high level courses than men, although the situation is improving somewhat (Armstrong, 1980; Fennema & Carpenter, 1981). A great deal of recent research has focussed on identifying factors which are related to women's decisions to drop mathematics when it becomes optional. People who work with young children need to be aware of these factors, many of which are attitudinal in nature. Student attitudes in junior and senior high school certainly are partially a result of experiences in the early grades. The elementary schools, as part of society, are part of the socialization process; schools are one place in which children learn sex roles and expectations for males and females, which are reflected later in course and career choice.

Sex-typing of mathematics as a male domain may inhibit both female achievement and interest in the subject. In addition, females may receive less encouragement from teachers and peers to achieve in mathematics. These hypothesized socialization processes may result in the attitudinal differences between males and females which have been found to be related to choice of optional mathematics in high school students. Three of the most important attitudinal variables will be discussed here.

Consistent sex differences have been found in confidence in one's ability in mathematics, perceived usefulness of mathematics to one's future, and career interests. Although no sex differences appear in lower grades, in middle grades and higher, males have been found to have more confidence in their abilities in mathematics, even when males and females are achieving equally (Fennema & Sherman, 1977, 1978). In these studies, confidence was highly correlated with mathematics achievement. The lack of confidence of females may well result in their not trying as hard because they think they just do not have the ability to succeed. And as mathematics becomes optional, (and harder) one is apt to drop out rather than persist if one thinks one lacks ability.

Usefulness of mathematics is another variable which is highly related to decisions to continue to study mathematics, and which has been found to differ considerably for the sexes, with boys perceiving it more useful (Armstrong, 1980; Fox, 1977; Hilton & Berglund, 1974; Skypek, 1980). Young children are not apt to understand why trigonometry is important, but they may still internalize subtle messages that mathematics is important for boys but not crucial for girls.

A final sex difference to be discussed here appears in career interests. Wise (1979) found that almost all sex differences in the number of mathematics courses taken in high school could be explained by differences in career interests in ninth grade. Kreinberg & Stage (1981) found that even young children have very sex-stereotyped careers in mind. Although these career interests certainly will change, the variety of options girls envision as possible needs to broaden if they are to consider mathematics-related careers. And without that interest, they may later drop mathematics, making a subsequent interest in a mathematics-department field difficult to pursue.

What impact can the schools have on the development of these important attitudes? Elementary school curricula and practices need to be examined carefully to determine if they may be, albeit unintentionally, contributing to sex inequities in mathematics. Textbooks have contributed for a long time to mathematics being viewed as a male endeavor. Newer books make some effort to be sex-neutral, but may do so by leaving people out of the books rather than showing both men and women engaged in extensive uses of mathematics (Federbush, 1974; Jay & Schminke, 1975; Kepner and Koehn, 1977, Kuhnke, 1977; Nibbelink & Mangru, 1978). Teachers can supplement books deficient in female role models by using biographies and other materials which focus on women who work in the math/science fields (see, for example, Kreinberg, 1977; Perl & Manning, 1982).

Certainly more attention needs to be devoted to providing information about careers and exposing children to real people who work in a variety of fields. The importance of mathematics to many careers, not just the hard sciences, needs to be understood by teachers so they can help children begin to recognize that importance at an early age. The usefulness of mathematics to many fields can be incorporated into interdisciplinary lessons in social studies or science.

Teachers also need to be aware of how they interact with children. There is some evidence that boys are involved in more teacher-student interactions relating to mathematics (Becker, 1981). Such differences may convey the idea that mathematics is more important for boys than girls, as well as providing boys more opportunity to talk about mathematics. Encouragement in mathematics, and expectations that girls will perform as well as boys, may help build that self-confidence so crucial to later study and achievement in mathematics.

In summary, we know that boys and girls achieve equally in mathematics in the elementary grades, but that boys do better in early adolescence and beyond. More research is needed before we can understand these achievement differences. Attitudinal differences also are accentuated in later years, when fewer females than males decide to study the advanced mathematics so important for future careers. The mechanisms through which sex differences in attitudes arise are not fully understood. But the results of dropping mathematics have clear consequences in career choice and advancement for women later in life. That many more women are capable of significant contributions in scientific and technical fields is clear. That elementary schools have a role to play in encouraging the full mathematical development of all students is equally clear. Ignoring the sex differences in achievement in, study of, and attitudes toward mathematics will not help them disappear. Awareness of where differences occur will help educators find ways to overcome them, and hopefully, prevent them in future students.

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STAGES IN THE DEVELOPMENT OF GENDER UNDERSTANDING: IMPLICATIONS FOR EDUCATION

by

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Mr. Jones and Jason

Mr. Jones was upset. He was watching Saturday morning cartoons with his son, Jason, who was almost four years old. They had just seen a commercial for a new doll which showed two little girls dressing and feeding "Betsy". After the commercial ended, Jason turned to his father and said, "Daddy, I want that doll for my birthday." Mr. Jones replied, "You want a Betsy doll for your birthday?"

"Yes," said Jason, "I want a doll like the one we just saw on T.V." Mr. Jones was worried that his son was becoming a "sissy". He thought that he had provided a masculine role model for Jason and he wondered where he, or his wife, had gone wrong. How could his son want a doll?

Mrs. Brown and Melissa

Mrs. Brown wondered what was going on with her four-and-a-half-year-old daughter, Melissa. Mrs. Brown and her husband made conscious effort to raise Melissa in a non-sexist fashion. They had refused to dress her only in dresses, or in pink and frilly clothes. They provided her with trains and blocks, as well as dolls to play with. And, they selected a preschool which had non-sexist curriculum materials and a wide range of dialy activities. Melissa had not only accepted these child-rearing practices without question, but she also seemed to enjoy correcting her parents when they "slipped" -- "Daddy, you should say firefighter, not fireman, 'cause girls can be firefighters too. We read a book about this in school today."

All was going fine until recently. As if from nowhere, Melissa began insisting on waring dresses to school, refused to play with trains and blocks, and wanted to play with dolls alone. When asked about her new preferences, Melissa responded, "I'm a girl. Girls wear dresses and play with dolls." Since Melissa had known that she was a girl for some time, Mrs. Brown wondered what caused her daughter to act so differently and insist on "being a lady". Moreover, since Mrs. Brown felt that the traditional feminine sex role was a disadvantage in today's world, she was worried about her little girl's future.

In recent years there has been a concerted push for non-sexist education; education that would not reinforce existing societal stereotypes of males and females. Such attempts acknowledge that conformance to traditional sex roles limits behavioral options for both sexes (an assumtpion that has been confirmed in the research literature, e.g., Bem, 1975). These attempts to decrease sex typing in society have been based on a learning position, a position that emphasizes the role of the environment in shaping a child's sex role identity (Bandura, 1969; Mischel, 1966, 1970). According to the principles of social learning theory, both direct reinforcement as well as observational learning or modeling of other persons and symbolic characters (e.g., books, television) are major determinants of children's sex role behaviors and identities. For example, if a boy is rewarded (through parental praise) for playing baseball (or if he sees other boys rewarded) while he receives no encouragement or praise for doll play, then he is more likely to play baseball than to play with dolls.

According to social learning theorists, sex role acquisition is not fixed as an early age, but instead is subject to change, as people observe various models (not just parents) in several settings. Rather than say "anatomy is destiny" as Freud did, social learning theorists maintain that sex-typed behaviors are not biologically based, but instead are open to modification (Bandura, 1969; Mischel, 1970). A good illustration of this is the increase in girls' and women's participation in sports that were once considered "masculine." As reinforcement systems changed (parental approval and encouragement, college scholarships, professional job opportunities, etc.), there was an increase in female' participation in athletics. This increase leads, in turn, to a great number of sports role models for girls in the future, which creates a snowball effect. It seems clear, then that at least some aspects of sex roles can be altered by changing patterns of reinforcement and the models available to individuals. These and other examples support social learning accounts of sex role development. On the other hand, the two introductory vignettes testify to the inadequacy of the social learning position to account for <u>all</u> aspects of sex role development.

As mentioned previously, social learning theory has served as a basis for a concerted push toward

non-sexist education, i.e., education that does not reinforce traditional social stereotypes of males and females. The intent of these efforts has been to make progress toward the goal of enlarging behavioral options for both sexes. (In this paper we will assume that the reader shares our view that such a goal is desirable, without presenting a justification for this assertion.) While these efforts are commendable, they have not been uniformly successful, especially in early childhood and elementary school classrooms. Children do not always behave in accordance with patterns of environmental reinforcement and in accordance with same-sex role models (Guttentag & Bray, 1974). The notion that if non-sexist attitudes and behaviors are reinforced and modeled, non-sex typed children will result, does not always hold true. In this paper we seek to show that this principle does not always work because it has overlooked a critical component. That component is the child's understanding of gender and of sex roles.

The Cognitive Development Theory of Sex-Role Acquisition

In 1966 Kohlberg proposed a cognitive developmental theory of sex role acquisition which focused on children's gender understanding. This approach down played environmental contingencies as a determinant of sextyped behavior, and instead concentrated on the child's cognitive organization of the world and how this organization interacts with the child's experiences. Kohlberg wrote that children have certain conceptions of gender which develop in stages during early childhood to preadolescence. These stages of gender understanding were said to be based on general properties of cognitive development as described by Piaget. Moreover, Kohlberg maintained that changes in gender understanding led to changes in sex role attitudes, values and behaviors. During the past 15 years a number of investigators have studied children's understanding of gender as it relates to sex role development. In the remainder of this paper we will review the highlights of this literature and discuss implications for educational practice. To anticipate one of our major points, if our educational objective is a "non-sexist child" then providing non-sexist education right from the start may actually hinder or delay the realization of this objective.

The Child's Understanding of Gender

There are two basic concepts that the child must learn regarding gender. First, the child must learn that s/he is either a boy or a girl. This concept has been termed "gender identity". Research concerned with determining when gender identity is established has shown that at least a rudimentary notion of being male or female is formed by the time the child is 18 months of age (Money & Ehrhardt, 1972). That the child has a notion of its own gender, even though s/he may not be able to articulate this information, is in accord with data that show that children at around 18 months are beginning to acquire a notion of him/herself (Lewis & Brooks-Gunn, 1979).

Table 1

Stages in the Development of Gender Understanding

Approximate Age	Stage of Gender Understanding	Concepts of Sex Roles	Educational Focus
1 - 2½ years	Self Gender Identity Correct labeling of self as "boy" or "girl".	None-Undifferentiated	Provisions of information about own gender label. Lack of differences in expectations between sexes. Lack of sex-typing based on roles. Encouragement of play with all varieties of toys.
2½ - 4 years	Other Gender Identity Correct labeling of others as "boy" or "girl".	Undifferentiated - Concrete/perceptual	Provision of information about gender label of others. Use of concrete perceptable non-value laden criteria (e.g., hair) for making of distinction. Encouragement of play with all varieties of toys.
4 - 5½ years	Self Gender Constancy[1] Knowledge that the sex of other persons is invariant.	Concrete/perceptual - Societal norms	Allow child to make use of available information to maintain distinctions between sexes. Model non-stereotyped behaviors, etc. Maintain distinction between sexes through use of non-value laden criteria.
5½ - 7 years	Other Gender Constancy Knowledge that the sex of other persons is invariant.	[2]Societal norms - Individual differences	Allow child to make use of available information to maintain distinctions between sexes. Model non-stereotyped behaviors, etc. Maintain distinction between sexes through use of non-value laden criteria. Begin expecting verbal acceptance of role diversity.
7 - 9 years	Constancy Explanations Ability to logically explain gender constancy judgments.	Individual differences - Nonprescriptive	Model non-stereotyped behaviors, etc. Expect greater role diversity and decreasing conformity to stereotypes in behavior.

[1]There is a brief transitional period between other gender identity and self gender constancy. In this period, children know that their own sex is invariant over time and "motive" or desire to change. Self and other gender constancy dimensions are described in the text.

[2]Individual differences refer to knowledge that there is variability within each sex role.

The second major concept is that of gender constancy. Gender constancy can be defined as the knowledge that sexual assignment is unchangeable. Kohlberg hypothesized that true understanding of gender constancy does not occur until about 7 years of age. Prior to this age the child, in response to a question of the following type, "If Jack wears a dress is Jack a boy or a girl?" generally says that Jack is a girl. Children are aware that only females wear dresses, so if Jack wears a dress he must be a girl. It is not until between the ages of 7 and 9 that children state that Jack would remain a boy in spite of his clothing.

Since Kohlberg's initial formulation of the cognitive developmental position, research has demonstrated that there are, in essence, four components of and five stages in the development of gender understanding. The four components and the order of their acquisition are as follows (Easton & Von Bargen, 1981): 1) labeling of self, then others as male or female, 2) stability, the recognition that gender is permanent over time, 3) motive, knowledge that gender cannot change even if one wants it to, and 4) constancy, knowledge that gender of the self and of others is invariant despite changes in activity, appearance, and psychological traits. Acquisition of understanding of each dimension appears related to general cognitive development as stated by Piaget (Marcus & Overson, 1978). The five stages of gender understanding are: 1) self-gender identity, 2) other gender identity, 3) self-gender constancy, 4) other gender constancy-correct judgments, 5) ability to adequately explain constancy judgments. Each of these stages will be more thoroughly described (See Table 1). Use of the word "stage" is not meant to imply that each phase in development can be separated entirely from the phases preceding and/or following. Rather, there is overlap in development. For example, self-gender identity is not fully established prior to a beginning understanding of other gender identity. Stage is used in the sense that each phase is essential to the development of the next phase.

Self-gender identity: State 1

First, gender identity is understood in relation to the self. That is, the child understands that s/he is a boy or a girl (Money & Ehrhardt, 1972). Self-gender identity is acquired between the ages of 1 to 2½ years of age. Thompson (1975) verifies this finding. Initially, the child, however, while being able to categorize him/herself as male or female on a rudimentary level is not necessarily able to articulate the knowledge. Instead, the child's behavior is used to demonstrate self-gender identity, with most of our knowledge coming from work with hermaphrodites. This research, exemplified by Money and his colleagues (e.g., Money & Ehrhardt, 1972), has demonstrated that by 18 months of age it is very difficult to assign the child to a sex other than that one decided on at birth. The explanation given is that even at such a young age past learning history has established some portion of the child's own identity as male or female. Change in treatment by others, based upon a change in gender assignment, leads to disruption of the child's own sense of self. While data are contradictory, there are many indications that males and females are, in fact, treated differently from birth (Bearison, 1979; Moss, 1974; Wasserman & Stern, 1978).

During acquisition of self-gender identity the child's understanding of sex roles is undifferentiated. That is, while having some basic inarticulate sense of self that incorporates gender, as well some basic understanding that his/her own mother and father can be expected to do certain things (e.g., Mommy always puts me to bed. I'll cry and call Mommy if Daddy tries), the child does not have an understanding of societal sex role divisions between males and females.

Other-Gender Identity: State 2

Once that rudimentary conception of the self is established the child learns the correct label for his/her sex. This "opens the door" for the child to learn two additional pieces of information. First, all persons can be classified as belonging to one or the other sex (other gender identity) and two, there are role differences between those persons labeled as male and those labeled as female. By the age of 2½ to 3 years the child can, in fact, accurately identify others as male or female (Kuhn, Nash & Brucken, 1978; Thompson, 1975, Wehren & De Lisi, Note 1, 1982). Further, the child can make assumptions about infants based upon the labeled sex of the infant (Haugh, Hoffman & Cowan, 1980) and can verbalize many stereotypes of the sexes (Kuhn, Nash & Brucken, 1978). Their understanding of sex roles is, however, based upon what is concrete and perceptual (e.g., physical appearance) rather than less apparent stereotypes (e.g., psychological traits) of which they have little understanding. Further, distinctions between males and females remain somewhat undifferentiated. That is, while they can classify others by sex and associate many stereotypes with each sex, there is no understanding of the societal base of those stereotypes and, therefore, no insistence that males or females actually conform to those stereotypes. In addition, children at this age are unable to explain judgments made in the gender constancy interview. While the child may be able to verbalize many sex role stereotypes (Kuhn, Nash & Brucken, 1978) by the age even of 3 years, the information seems to be passively received rather than actively sought out (Ruble, Balaban & Cooper, 1981).

A transitional phase between other gender identity and self-gender constancy is also apparent from the literature (Eaton & Von Bargen, 1981; Marcus & Overton, 1978; Slaby & Frey, 1975). The child learns that the motivation to change gender is insufficient to alter one's sex; gender cannot change even if one wants it to. S/he also learns that gender remains stable even with the passage of time. Children asked questions of the following types, "If you wanted to be a boy, could you

be?" and "When you grow up, will you be a boy or a girl?" will answer those questions correctly by age 5. At the same time, they are unable to answer the following type of question correctly: "If you wear a dress will you be a boy or a girl?" (asked of boys).

There are two major hypotheses for why understanding of motive and stability precede understanding of other aspects of gender constancy. Gouze and Nadelman (1980) explain this pattern of development by reference to the child's general inability to conserve over changes in stimulus. Support for this position comes from Marcus and Overton (1978), who found correlations between understanding of gender constancy and understanding of conservation specifically conservation of identity and equivalence. An alternative explanation involves the lack of societal norms involved in determinations of gender stability. In other words, while society has something to say (stereotypes) about how males and females "should" look, act and feel, there are no such constraints on ageing. Examination of explanations of constancy judgments revealed that children age 5 explained incorrect gender constancy judgments by reference to societal norms. For example, children would say, "Jack is a girl, boys can't wear lipstick." in response to the following question, "If Jack wore lipstick would Jack by a boy or a girl?" (Wehren & De Lisi, Note 1, 1982). While s/he is acquiring this understanding, the child is beginning to acquire knowledge regarding the stability of other persons' gender as well.

Simultaneously with the development of these two related concepts (actually form birth onward) s/he is exposed to a tremendous amount of information about societal expectations of the sexes. This information is both direct, as in role divisions within their own home (Thrall, 1978) as well as indirect, as in television (DeFleur & Defleur, 1967; McGhee & Frueh, 1980; Slaby & Quarforth, 1980). The information has a substantial impact on the child's views of the sexes for two major reasons. First, the information received from direct and indirect sources complement one another to a great extent (e.g., most household tasks are still performed by the women, and television portrays the sex role division within the home), thus lending additional weight to it. Second, while the child knows that persons can be divided into two sexes, male and female (other gender identity), s/he is searching for the criteria to use to make this distinction. Thus, the information received is seen as prescriptive, i.e., necessary to one's gender identity rather than as simply descriptive, i.e., not essential to gender identity but merely descriptive of how males and females tend to look, act and feel in this culture. (Recall that stability of gender, knowledge that gender does not change over time, is already understood. In the case of stability there are no societal role expectations, persons age at the same rate regardless of sex. Therefore, description and prescription are equivalent, making stability a much easier concept to acquire.) The assumption of equivalence between description and prescription (Kohlberg & Ullian, 1974, Ullian, 1976) leads to a fairly high degree of sex typing by young children, sex typing that appears to be fairly independent of their own personal experience. For example, despite variation in their personal life experiences Wehren (Note 2) found that children age five had same sex friends, engaged in sex stereotyped activities and were sex typed in their choice of future occupation. Other research (Best, Willaims, Cloud, Davis & Robertson, 1977) verifies this high degree of sex typing, including a strong tendency toward same-sex play groups (Bianchi & Bakeman, 1978). The child ensures that s/he can distinguish between the sexes by denying any overlap in roles, attitudes and behavior. There is little or no acknowledgement of individual differences at this stage; instead firm divisions between the sexes are the rule. In fact, children at this age appear to actively seek out information that helps them to further divide the sexes (Ruble, Balaban & Cooper, 1981). At this stage societal norms or expectations are provided as explanations for constancy judgments (most of which are incorrect). For example, a girl age 5 years is asked: "If you play with cars, are you a boy or a girl?" An answer frequently received is: "A boy. Boys play with cars, not girls."

Why are description and prescription initially viewed as identical? Why do children divide the sexes so clearly? It appears that this assumption of equivalence serves an important function for the establishment of self-gender constancy. Since the child at this age (4-5½ years) is unsure that his/her own gender cannot change, in order to both maintain security about his/her own gender identity and unequivocably establish self-gender constancy, it becomes necessary for the child to insist that description equals prescription of roles. The sex typing both in behavior and in words (e.g., "girls can't do that") seen by parents and teachers who have tried to raise their child in a non-sexist fashion is expressive of the child's need to assert their own gender identity -- "As long as I act like a girl, then I won't become a boy." Thus, the adherence to stereotypes can be viewed as necessary to consolidation of both self-gender identity and self-gender constancy (Ullian 1981; Wehren & De Lisi, Note 1).

Other-Gender Constancy: Stage 4

The same reasons for sex typing of the child's own behavior and appearance are involved in the child's sex role stereotyping of others. While beginning to become confident of the unchanging nature of his/her own sex, the child is still in the beginning stages of this understanding as far as others are concerned (Eaton & Von Bargen, 1981; Emmerich, Goldman, Kirsch & Sharabany, 1977; Marcus & Overton, 1978). Therefore, again the child draws absolute divisions between the sexes, insisting that boys act and dress in ways that are different from girls (description equals prescription). It is not until other-gender constancy is established (age 7) that children are able to accept individual differences in sex roles. That is, children learn that behavior attitude and dress that are not congruent with sex stereotypes are not threats to either their own or others basic gender identity. At this age judgments are often correct while explanations of those judg-

ments are inadequate. There still remains a grudging respect for societal expectations, as illustrated by the following response within the gender constancy interview: "Even if he wears lipstock, Jack would be a boy. But he's like a girl because only girls wear lipstick." Even when explanations are correct, there is also a continuing attempt to maintain clear division between the roles, and acting like the opposite sex is not viewed very positively. In other words, there is still a strong emphasis on conformity to society's role assignments.

Constancy Explanations: Stage 5

Between the ages of 7 and 8½ to 9 years the child learns not only to provide correct judgments in response to the gender-constancy questions but also to explain those judgments correctly, by reference to the unchanging nature of gender. There is greater acceptance of individual variation in role and the male and female roles are not seen as mutually exclusive.

Greater acceptance of nonconformity to society's expectations is now possible, although "qualifiers are often added to the explanations given (see the above example). In order words, no longer are description and prescription seen as one and the same (Kohlberg & Ullian, 1974; Ullian, 1976; Wehren & De Lisi, Note 1, 1982). Research demonstrating a decrease in stereotyping after age 8 or 9 confirms this conclusion, indicating greater acceptance of individual differences in roles, acceptance that includes understanding that male and female roles are not mutually exclusive (Ullian, 1975).

Education Implications

The information regarding the child's changes in gender understanding with age has profound implications for education. In essence, attempts to produce non-sexist 5, 6, and 7 year olds are doomed to failure before they start. In order to establish gender identity and then gender constancy, children need concrete perceptable means of distinguishing between the sexes. If they are not provided with these means they will probably create them (Ullian, 1981); the child must use whatever tools are available to distinguish between the sexes. We must, therefore, assume that children will be fairly sex typed until they are at least age 7, regardless of the education they receive. This sex typing is the means by which gender understanding is acquired by the child.

What does this mean for education? Should we forget about any attempts toward non-sexist education The answer to the second question is "No". What is necessary is re-evaluation of what we can expect from children who have differing levels of gender understanding and therefore re-evaluation of the focus of education provided to children. The re-evaluation does not require that there be any alteration of the end goal (a "non-sexist" child) but rather does mean that procedures to meet this goal must vary with the level of gender understanding exhibited by the child.

Table 1 summarizes the educational focus that should predominate at each stage of gender understanding. The focus takes into consideration both the child's level of understanding, the information the child needs in order to establish gender understanding, and the end goal of a "non-sexist" child. At Stage 1 the child's task is to acquire self-gender identity as male or female. The information that the child needs concerns division of persons into the two genders and some behavioral indication from the parent and teacher (if relevant) about the group to which s/he belongs The child can be provided with concrete, perceptable means of distinguishing the sexes that are not value laden; for example, physical appearance. While providing this information it is necessary for both parent and teacher to maintain long-term expectations for the child that are not gender based and to expose the child to non-sex typed behavior, so that distinction between persons are not based on role. Encouragement of play with all toys, even those generally thought of for the "opposite sex" is also appropriate.

At Stage 2 (acquisition of other gender identity) essentially the same educational focus should prevail as at Stage 1. The intent of this approach is to provide the child with the tools s/he needs to acquire gender identity while not promoting distinctions between the sexes that imply differences in competence and/or roles.

At Stage 3 (acquisition of self-gender constancy) the focus of educational efforts from Stages 1 and 2 should be continued. In addition, however, the parent/teacher should not be disturbed or discouraged by what may appear to be extreme sex-typing by the child. Nor should they discourage this sex-typing. The home and school are not the only sources of sex role information for the child. Television, peers, and observations in other settings also provide information and it must be remembered that at this time the child will be actively seeking such information. This active search is indicative of the child's attempts to understand gender differences. Provision of information about genital differences will not be sufficient since research has shown that children, even those from "enlightened" homes do not understand that genitals are the true basis for differentiation of males and females until age 11, even though they may be aware of this difference as early as age 2 (Galenson & Roiphe, 1974). The important task for the parent and teacher is to model behaviors that are not sex-stereotyped, thus introducing to the child behavioral variation in roles. This exposure is essential since sex-role development does have a substantial social learning component (De Lisi & Johns, Note 3). One cannot expect this behavioral variation of the child, however. In fact, placing such demands on him/her may actually delay acquisition of gender constancy.

At Stage 4, again the same educational focus as that provided at Stage 3 should prevail. The one addition is as follows: By about age 7 the parent/teacher can begin making demands on the child for verbal acceptance of role diversity and non-sex typed behavior. Verbal acceptance is all that can be required at this time, however. Until the child can correctly explain his/her judgments of constancy, behavioral diversity cannot be expected.

This brings us to the final stage of gender understanding--the ability to logically explain gender constancy judgments. At this stage the child's level of gender understanding is sufficient to expect decreasing conformity to stereotypes in behavior and greater role diversity.

The prospective on non-sexist education presented in this paper contradicts more efforts in non-sexist education since reinforcement of cross-gender behaviors is not encouraged until the child is at least 7 years old. The general view in the past has been to discourage the child from drawing any distinctions between the sexes. In light of the child's acquisition of gender understanding, not only does this seem to be an impossible task (Ullian, 1981) but it also may hinder or delay the development of gender understanding. It is essential to the development of gender understanding that the child is provided with and/or allowed to use whatever concrete perceptable means are avilable to draw initial distinctions between the sexes and then to determine that gender does not change with age physical appearance, behavior or psychological traits. This position does not require that our end goal be abandoned or altered. Instead, it requires that we modify our expectations of the child since the non-sexist child does not begin to become a true possibility until age 7. Nor does this position deny the influence of social-learning mechanisms. Social-learning factors are important (e.g., Bianchi & Bakeman, 1978); therefore, it is necessary to model role diversity while maintaining differences between the sexes that do not imply differences in competence (e.g., physical appearance). In conclusion, effective efforts to combat sex-typing must consider not just social-learning factors but also child's changing view of gender.

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SEXISM, PLAY, AND CHILDREN'S LEARNING

by

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Play is the vehicle for learning of the young child. Recent research findings indicate that play is "basic to intelligence and a key to facilitating the growth of thinking in children" (Yawkey, 1979:249). As a number of writers have commented, play is related to many abilities affecting the child's achievement in school (Glickman, 1979; Wolfgang, 1974; Moffitt, 1972; and Vander Ven, 1976). It is essential that a young child participate in a wide variety of play activities.

Sex stereotyping limits the play choices of children in our society. Historically, children's play has mirrored society's traditional attitudes toward sex roles (Sutton-Smith and Rosenberg, 1971). Hurlock (1964:480) concludes that "... children become aware at an early age that certain types of play are considered appropriate for boys and others for girls." Sex role stereotyping in play begins early and continues throughout childhood. In fact, sex differences in play have been observed in infants (Lewis, 1972), toddlers (Fein, 1975), preschoolers (Rubin, 1976), and school-age children (Lever, 1976).

Some of the sex differences reported in the play activities of preschoolers in the last forty-five years are given in Table 1. An examination of these findings illustrates that boys participate in play activities society considers masculine and girls participate in one's considered feminine.

Table 1
PREVIOUS STUDIES REPORTING SEX DIFFERENCES
IN PLAY ACTIVITIES OF YOUNG CHILDREN

Study	Sex	Findings
Rubin (1977)	Males	Blocks, wheeled vehicles
	Females	Art activities
Tizard, Philps, & Plewis (1976)	Males	Tires, crates, wheeled vehicles
	Females	Climbing frame
Harper & Sanders (1975)	Males	Sand, tractor, climbing frame
	Females	Arts & crafts
Coates, Lord, & Jakabovics (1975)	Males	Blocks
	Females	Dolls, formal games
Cramer & Hogan (1975)	Males	Blocks, vehicles
	Females	Dolls, furniture
Clark, Wyon, & Richards (1969)	Males	Blocks, wheeled vehicles
	Females	Dolls, art activities
Shure (1963)	Males	Blocks
	Females	Doll area, art
Vance & McCall (1934)	Males	Blocks
	Females	Housekeeping
Parten (1933)	Males	Blocks, trains, kiddie-kars
	Females	Art activities, house play

In recent years the media, education, industry, and government began efforts to eliminate sexism. A national nonsexist movement has had as its major thrust expanding the roles and opportunities for both males and females.

Since sexism influences play which is crucial to the child's development and achievement, it is imperative that early childhood educators continue to study sex differences in children's play. The purpose of this 1980 research was to examine the sex differences in the play activities of three-, four-, and five-year-old children. Are society's traditionally sex stereotyped attitudes changing as reflected in children's play?

Procedure

The fifty subjects were enrolled in preschool programs at a midwestern university. More than half of the children (twenty-eight) were from the community, thirteen were children of university students, and nine were children of university faculty. The twenty-five males and the twenty-five females ranged in age from thirty-six to sixty-four months.

Five play activities that previous studies had shown to have been consistently male- or female-oriented were selected for this study (see Table 1). Blocks, wheeled vehicles, and water/sand were the male-oriented play activities; house play and art projects were the female-oriented play activities.

An observational instrument to record each subject's daily play activities was developed by the researchers. Three graduate student observers were trained to use the instrument. Observations were conducted three days a week for six weeks, making a total of eighteen observational periods. Each observation was for thirty minutes during free play time.

Findings

To test the null hypothesis of no sex differences in the play activities, the data were analyzed using a multivariate analysis of variance (MANOVA). This analysis revealed a significant multivariate F-ratio (Multivariate F=7.54; d.f.=8.41; p.0001). The null hypothesis was rejected; there were sex differences in the play activities.

To test individual null hypothesis of no sex differences, post hoc comparisons of the cell means for each of the play activities were obtained by calculating univariate F-ratios. The results of the post hoc comparisons are given in Table 2.

All three male-oriented play activities were statistically significant at the .05 level. Blocks, wheeled vehicles, and water/sand were sex stereotyped with significantly more boys than girls selecting these activities.

One of the female-oriented play activities was statistically significant at the .05 level. Art projects were sex stereotyped with significantly more girls than boys choosing this play activity.

Table 2
UNIVARIATE F-RATIOS FOR PLAY ACTIVITIES

F-Ratios	df	MS	F	P
Blocks	1	11.21	28.29	.0001
Residual	48	.40		
Wheeled Vehicles	1	4.85	7.05	.01
Residual	48	.69		
Water/Sand	1	2.15	4.83	.05
Residual	48	.45		
House Play	1	.73	2.42	
Residual	48	.30		
Art Projects	1	1.47	5.35	.05
Residual	48	.27		

One of the female-oriented play activities was not statistically significant at the .05 level. House play was not sex stereotyped, but a play activity chosen by both boys and girls.

Conclusions

The findings of this 1980 research differ very little from those of earlier studies. The three male-oriented play activities (blocks, wheeled vehicles, and water/sand) were sex stereotyped, a finding consistent with previous research. One female-oriented play activity, art projects, was sex stereotyped, again concurring with earlier findings. Only one play activity produced results again concurring with earlier findings. Only one play activity produced results differing from results of previous studies. In this study, house play was not sex stereotyped.

This research indicates there may have been some change in the sex stereotyping of play activitie of young children. If so, the change has been in only one direction. In this study, boys' play choices had expanded to include house play, a traditionally female-oriented play activity. The girls' play choices, however, had not expanded.

It may be that the national movement towards eliminating sexism has had some impact on the sex role stereotyping of children's play, such as house play. The increased number of working mother combined with fathers helping more at home may be partially responsible for this change. Another contributing factor may be the current emphasis on bonding and attachment of infants and fatherin-

Since a young child learns through play, a wide variety of play activities will enhance the development and school achievement of the child. Sexism in play, like all sexism, restricts individuals, interfering with the fulfillment of their potential.

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DO THE CHILDREN IN OUR SOCIETY SEX STEREOTYPE OCCUPATIONS?

by

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In the last two decades, our society has become increasingly aware that sex should not be a means of defining one's role in the working world. This researcher became interested in seeing if the children in our society had also become aware of this fact. This researcher was also interested in how early children develop attitudes concerning sexual stereotypes and wanted to see if these attitudes differed between age groups and sexes. The answers to these questions would be beneficial to parents and teachers. Is there a group (parents/teachers) that is fostering non-sexist attitudes? At what age are these attitudes developed? The research problem was defined in order to answer these questions.

There have been a wealth of studies done in the seventies and early eighties on sex differences and their significance in education. There has been much research done in the area of books (basals, supplemental books, picture books, etc.) and their content. It has been shown that basal series books published before 1976 have a definitely sexist content (Britton and Lumpkin, 1977). On books published after 1976, there seems to be an attempt at equal representation of the sexes (Rupley, Garcia, Longnion, 1981). Picture books published in the 1970's and 1980 (Nilsen, 1978; Engel, 1981) and supplemental books published in 1977-78 (Rupley, Garcia, Longnion, 1981) were also found to be sexist in their content. Other "research indicates that one cannot predict with desired certainty the consequences of reading, and since a reader's predispositions, far more than the content of what is being read, determine the materials effect on the reader (Beach, 1976), it follows that the individual who is apparently influenced by sexist material has already been indoctrinated by other environmental factors that may or may not include previous reading" (Tibbetts, 1978).

It is these "environmental" factors that were of interest. What were the environmental factors that influenced the child? Was it the home environment, the school environment, physical maturity, or just society in general that fostered these attitudes? One purpose of this study was to identify the age at which the child possessed attitudes of sexual stereotyping of occupational roles. If the age could be identified, it might be possible to identify possible environmental factors which affect positively or negatively the acquisition of sexist attitudes in children.

The research was done at a small private grade school in the Midwest. The school was located near the downtown area, and the students represented a cross-section of socio-economic levels. All of the students in the Kindergarten and fourth-grade classes participated in the study - nine Kindergarten girls, ten Kindergarten boys, twelve fourth-grade girls, and seventeen fourth-grade boys.

Four one-hundred work passages were written for use in the study. Each was reviewed by a panel whose members consisted of people in the field of reading education. Pronouns and proper names were not used in the construction of the paragraphs in order to keep the language of the passage free of any suggestion of gender. One passage was written about a nurse (a typically feminine job). Another was written about a firefighter (a typically masculine job). Non-sexist jobs were identified by the panel as a writer and a professional singer, and paragraphs were written about people who had those jobs.

Each child was read each paragraph individually in the same order - writer, nurse, firefighter, singer. Before each story, a purpose for listening was given. The following questions were asked after each story. 1) Do you think this person was a man or a woman? If the student answered "Either," there was no need for a second question. If a "Man" or "Woman" response was given, this second question was asked. 2) Do you think it could have been a man/woman? (dependent upon response to first question). The paragraphs and the exact format used are attached as an appendix.

The results of the responses to the questions are listed in Table I. Results are recorded in percentages. Responses to the first question are in the left column. Responses after the second question are listed in the right column. Responses to the first question were classified according to the following four categories: 1) man, 2) woman, 3) either ("It could be a boy or a girl." "Both." "Man or woman."), or 4) other ("I don't know." "I am not sure 'cause there are both boy and women nurses." "I'm not sure."). "Yes" or "no" responses were given to the second question. A "yes" response to the second question was considered an "either" response and added to that category and subtracted from the one it was previously listed under ("man" or "woman"). These results are shown in the right column of Table I. For example,

after the first question 22% of the Kindergarten girls felt that the singer could be either a man or a woman. After asking the second question, many responded yes; this brought the number to 67% of the Kindergarten girls feeling that the singer could be a man or a woman after the second question. For another example, look at the fourth-grade totals. After the first question, 7% of the fourth-grade boys and girls felt the writer was a woman. After being asked the second question, each of those students responded "yes." Thus, that percentage became zero, and the 7% was added to the right hand column under "Either."

Table I

Responses to Interview Questions

		1/2 Man		1/2 Woman		1/2 Either		1/2 Other	
Kindergarten girls	Writer	78%	33%	22%	11%	-	56%	-	-
	Nurse	-	-	89%	56%	11%	44%	-	-
Sample no. - 9	Firefighter	89%	78%	11%	-	-	22%	-	-
	Singer	33%	11%	33%	11%	22%	67%	11%	11%
Kindergarten boys	Writer	90%	40%	10%	10%	-	50%	-	-
	Nurse	20%	-	70%	30%	10%	70%	-	-
Sample no.- 10	Firefighter	90%	80%	-	-	10%	20%	-	-
	Singer	40%	30%	20%	-	40%	70%	-	-
Kindergarten Total	Writer	84%	37%	16%	11%	-	53%	-	-
	Nurse	11%	-	79%	42%	11%	58%	-	-
Sample no. - 19	Firefighter	89%	79%	5%	-	5%	21%	-	-
	Singer	37%	21%	26%	5%	32%	68%	5%	5%
4th grade girls	Writer	75%	-	17%	-	8%	100%	-	-
	Nurse	-	-	83%	33%	17%	67%	-	-
Sample no. - 12	Firefighter	92%	92%	-	-	-	-	8%	8%
	Singer	17%	-	33%	8%	50%	92%	-	-
4th grade boys	Writer	82%	12%	-	-	12%	82%	6%	6%
	Nurse	-	-	65%	6%	29%	88%	6%	6%
Sample no. - 17	Firefighter	82%	53%	-	-	18%	42%	-	-
	Singer	24%	-	18%	-	53%	88%	6%	12%
4th grade Total	Writer	79%	7%	7%	-	10%	90%	3%	3%
	Nurse	-	-	72%	17%	24%	79%	3%	3%
Sample no. - 29	Firefighter	86%	69%	-	-	10%	28%	3%	3%
	Singer	21%	-	24%	3%	52%	90%	3%	12%

There are several points that I feel should be noted from the table of results.

1) Fourth-graders responded 5%-16% higher than Kindergarteners in "either" responses after the first question. This indicates that fourth-graders are less sexist in their attitudes than Kindergarteners.

2) Fourth-graders responded 10%-37% higher than Kindergarteners in "either" responses after the second question, indicating that even when given a "yes" or "no" choice, that fourth-graders still have less sexist attitudes than Kindergarteners.

3) On first response, the writer was seen as a man 78%-92% of the time by both age groups and sexes. The students saw a writer, termed a non-sexist job by the panel, as a male-oriented job.

4) On first and second response, more girls (33%-89%) than boys (6%-70%) felt the nurse had to be a woman. The girls stereotyped the job as female much more often than the boys.

5) Nurse was stereotyped most heavily as a female.

6) Firefighter was stereotyped most heavily as a male.

7) Most boys and girls did not stereotype the singer in either sex role, showing that there are occupations which children feel have no sexual orientation.

8) Kindergarten girls are more sexist in overall responses. In nearly every instance, Kindergarten girls had the highest percentages in sexist responses.

From these findings, these gereralizations can be drawn.

1) Since fourth-graders are less sexist in their attitudes than are Kindergarteners, perhaps it is true that schools (teachers) are in fact more successful than home (parents) at diminishing sex stereotyping of occupational roles. The Kindergarteners seemed to rely on what their parents had told them to answer the questions, and their answers were usually sexist. One Kindergarten girl had this response to the passage about the nurse: "My daddy told me that men cannot be nurses unless they disguise."

2) In view of the fact that fewer girls than boys allowed the nurse to be a man, it seems evident that girls sex stereotype occupational roles more than boys. Have we taught boys to see all the occupational opportunities available while somehow denying girls this? Are we really in an era of "womens' liberation?" If so, we still have a long way to go.

3) Since a writer (defined by the panel as a non-sexist job, does that mean that children still see office work as primarily connected with men? It seems that few children really know the extent to which women are participating in the work force. Maybe successful working women should come speak in our schools to dispel some of the myths our children have. Many possibilities exist to improve upon the present situation.

Note that sample size is a limitation of the study. The short data collection sessions were subjectively analyzed, yet still replicable. There are some significant percentages that did arise to reinforce research presently available and call for further research in the area. Until longitudinal, in-depth research is achieved in this area, teachers must continue their efforts to dispel sex stereotyping of occupational roles in their classrooms.

APPENDIX

Story 1

I am going to read you four short stories. After I am through with each story, I will ask you a question or two about the person in the story. Listen closely!

This person makes a living by writing books for children. This person drives into the city everyday to work. This person has a desk, typewriter, and many colorful pictures on the wall in the office. Some of the pictures will be put in the book that this person is writing now. It is a book about Indiana. This person has written very many stories and books for children. This person usually writes stories about all the exciting places that this person has been. After this person finishes the book about Indiana, this person will go to New York and begin to write a book about New York City.

Now some questions-

Do you think this person was a man or a woman?
Do you think it could have been a _____?

Story 2

I want you to listen closely to this story to see if you can tell whether this person is a man or a woman.

This person is a nurse and works at Memorial Hospital. As a nurse, this person has many important duties. In the morning when this person gets to work, this person checks in on the patients to see if they need anything. During the day this person will have many other jobs to do such as taking temperatures of the patients, giving shots, and giving medications. In the evening before leaving work, this person has to check the patients' charts to make sure all the doctors' orders are carried out. This person enjoys being a nurse and caring for people.

Do you think this person was a man or a woman?
Do you think it could have been a _____?

Story 3

I have another story for you to listen to. Listen closely, and I will ask you the same questions when I am through.

This person also works in our community caring for people. This person works at the fire station. When this person gets to work, this person has to check the fire truck to see if it is running all right. This person can't wait until the alarm rings to check the truck. This person drives the fire truck. When the alarm sounds this person slides down the fire pole and races to the driver's seat. In a flash, they are at the fire. There, this person is in charge of attaching the hose to the fire hydrant. After the fire is put out, this person drives the truck safely back to the station.

Do you think this person was a man or a woman?
Do you think it could have been a _____?

Story 4

And now our very last story...

This person has a very exciting life. This person has been on television many times. This person is a popular singer. This person has made a lot of money from singing hit songs. You can hear many of this person's songs on the radio everyday. You can also buy records and tapes with songs this person has sung. This person has a very busy life. This person must get up very early in the morning to record music at the studio. On some days this person has to be on three different television shows. Can you imagine? Sometimes this person works until 4:00 in the morning singing at a club in Las Vegas. What a busy life!

Do you thing that this person was a man or a woman?
Do you think it could have been a _____?

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OUT, DAM NED SPOT; YOU TOO, PUFF!

by

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Caught in a maelstrom of windy controversy, the educational machine consistently obliges society to rivet attention on first one and then another of the possible causes of learning malaise and of teaching complications. Earlier chronicles record initial trends--boys first, girls never; but only recently have professionals QUESTIONED whether, in FACT, boys' and girls' learning abilities, patterns of achievement, and social interactions could be characterized on a basis of sex identity.

History's fingerprint on society has definitely left us with distinctive whirls, role expectation being among the most insidious of convolutions. To test the reader on this issue, I offer the following list. Run down the list mentally and see how often the mind identifies a sex with a role and/or job. If the reader is honest s/he will find thoughts such as these:

1) Let's see--could be BOTH, I suppose;
2) Male came to mind first (though I am SUPPOSED to see it as both);
3) Female came to mind first (though I am SUPPOSED to see it as both);
4) Definitely male; definitely female.

Athlete	Teeny-bopper
Farmer	Fisherman
Banker	Mortician
Hair stylist	Actress
Lumberjack	Bartender
Cattle rancher	Beautician
Chef	Beach comber
Pickpocket	Nun
Cab driver	Sea captain
Preacher	Model

Actually, what we perceive through exercises such as these is that most persons have been CONDITIONED to think in such terms by human operations (of which education is one) in society itself. Illustrators of magazines and books must put SOMEBODY in the doer's role unless robots become sufficiently interesting to model the activities which are presumably engaged in by humans (or huwomans).

Teachers have not been immune to this conditioning. Sometimes, we hear them speak: "Oh, those boys! They're so rowdy, quarrelsome, loud, vulgar, messy, etc., etc. Thank goodness for the girls who are quiet, neat, precise, docile, etc., etc." Or we tune in on another day to hear, "Oh, those girls! They're so catty, fussy, clique-ish, sassy, nasty, etc., etc. Thank goodness for the boys who are so open, straightforward, fun, eager, manly, strong, etc., etc."

It may be said that teacher attitudes (parent attitudes, society's attitudes) and the conscious/unconscious transmission of the same are far more volatile sources of sex-role stereotyping than all the illstrated texts rolling off the presses. Even household pets have provided sex roles for young children, the cat being the "girl" and dubbed Kitty while the dog is the "boy" and named Rex or King. Uncomplimentary barbs equate women to cats and men to curs! (One notable exception: the female maternal canine.)

Macoby and Jacklin have done a mammoth project on sex differences in the schools, outlining popular myths, a few seemingly "proven" differentiations, and several questions.

Myth One:	Girls are more "social" than boys.
Myth Two:	Girls are more suggestible than boys.
Myth Three:	Girls have lower self-esteem than boys.
Myth Four:	Girls lack motivation to achieve.
Myth Five:	Girls are better at rote learning and simple repetitive tasks. Boys are better at high-level tasks that require them to inhibit previously learned responses.
Myth Six:	Boys are more "analytic" than girls.
Myth Seven:	Girls are more affected by heredity, boys by environment.
Myth Eight:	Girls are "auditory," boys "visual."

Difference One:	Males are more aggressive than females.
Difference Two:	Girls have greater verbal ability than boys.
Difference Three:	Boys excel in visual-spatial ability.
Difference Four:	Boys excel in mathematical ability.
Question One:	Are there differences in tactile sensitivity?
Question Two:	Are there differences in fear, timidity, and anxiety?
Question Three:	Is one sex more active than the other?
Question Four:	Is one sex more competitive than the other?
Question Five:	Is one sex more dominant than the other?
Question Six:	Is one sex more compliant than the other?
Question Seven:	Are nurturance and "maternal" behavior more typical of one sex?
Question Eight:	Are females more passive than males?

Some in education would argue that if the above named boys and girls were exchanged for blue-eyed/brown-eyed/other-color-eyed in various combinations, equally broad generalizations would emerge from such studies. Any many more questions!

The pendulum has swung from one extremity to the other and is on its way back to a middlin' position. From a totally male-dominated society the outcry of feminists has shifted the focus to an opposing point of view. But the weight hangs too heavily on that second position just as it did in the first. There is a feeling that the second point of emphasis is no better than the original one. Males are not superior and neither--one hesitates to say in such trouble times--are females. It isn't the sexual identity that provides worth/status/grandeur; it's the person-hood development, that gradual unfolding, evolving, expanding, enlarging, maturing, fulfilling, and fulfilled self.

All of which brings to the key issue: boys AS WELL AS girls, women AS WELL AS men, need to have a curriculum of self-concept--not BOY-concept, not GIRL-concept, but SELF-concept, PERSON-concept, DEVELOPMENT- and GROWTH-concepts. Both sexes have much in common not presently being capitalized on in educational settings as a whole. Each person, whether female or male, has a unique collective and integrative history. Each unique history is modified by distinct and yet commonly held avenues of change: relating, valuing, thinking, working, relaxing. Each needs a positive, realistic, and balanced assessment of self with a concommitant assessment of environment. Each requires a definite and purposeful mode for self-direction.

Consider the Hexagon of Sex-Role Interaction (Figure 1). There are only two places where male and female are equated: Segments I and IV. Chauva-militant men and women, boys and girls, conflict. Reasonable and balanced equality, in which both are accepting and respectful of each other, can be found as society's new ideal wherein strength and gentleness (and myriad other anti-posited qualities) are found inseparably united in each individual regardless of sex. It may be argued that as long as the sexes battle each other, society may expect little help from either! They're too busy flexing muscles and calling names, dredging up old feuds, singing "Anything You Can Do, I Can Do Better" at the top of their collective lungs!

The school, next to the home, is the foremost agency of social formation. When shall we get to that enviable point where equality shall be respectful and reasonable except in a curriculum design which provides for individual differences, which puts enough of every level of psychomotor activity, intellectual exercise, and affective development to allow for in-depth student choice and achievement? SOME girls LIKE to tinker with machines, just as SOME boys like to be turned loose on domestic tasks. Males and females both have areas of sensitivity--and both can be equally insensitive. Wasting time and psychic energy on Which-Is-Which is futile. There is enough to do in this world for all manner of folk. Yes, history will hinder immediate dissolution of sex role stereotypicism but we can do much to replace the stereotype by concentrating on the person instead of on the sex of the person. Let us pursue learning which appeals to the individual's assimilating style, teaching, EDUCATING, with variety and excellence, failing to assign roles and succeeding in fostering real people who are free to grow.

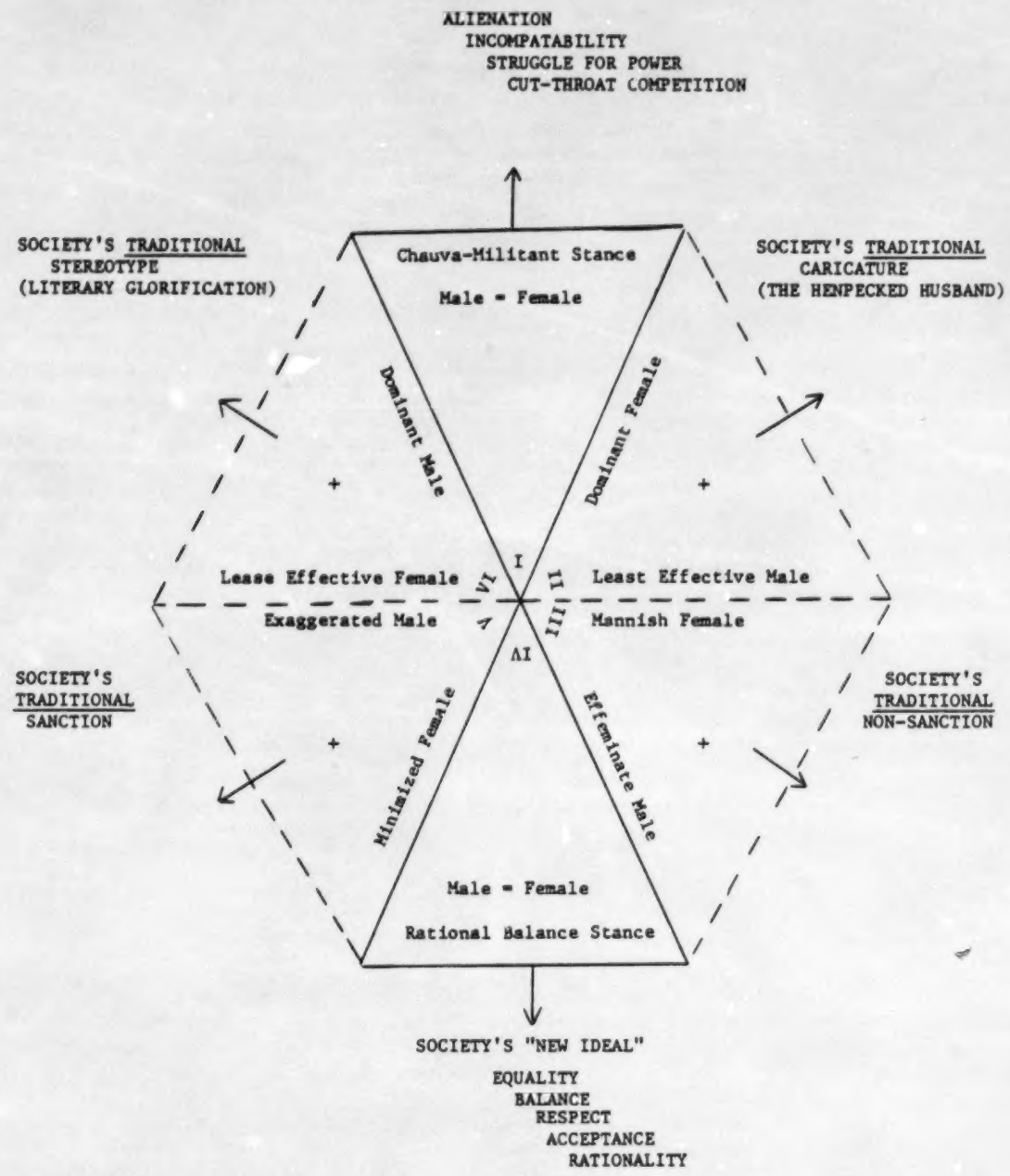

Figure I
HEXAGON OF SEX-ROLE INTERACTION

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PRESERVICE TEACHERS: KNOWLEDGE & ATTITUDES ABOUT WOMEN

by

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Recent literature has called for a renewed interest in sex equity in eduation. Sadker, Sadker, & Hicks (1980b) declared that sex equity in teacher education programs must be a focus for this decade. It is well documented that sexist thinking is ingrained in our society and that the subtlties of sex-role bias continue to dominate the educational scene. Research has indicated that male and female students continue to be educated differently due to three major factors: 1) bias in curriculum, materials, guidance, and testing; 2) differential teacher and counselor attitudes toward and treatment of males and females; and 3) differential student attitudes (Stacey, Bereaud, & Daniels, 1974; Safilios-Rothschild, 1979). These factors contribute to the continued acceptance of traditional sex-typed behaviors in career selection and life choices.

A decade ago, a book entitled Sexism in Schools and Society was written with the obvious intention that this material would stimulate educators to evaluate stereotypical attitudes and sex-biased behaviors that inhibit the development of male and female students toward their fullest potential (Frazier & Sadker, 1973). Today, despite the passage of Title IX, we find that relatively few changes designed to promote sex equity have been systematically incorporated into our educational system.

The National Council for the Accreditation of Teacher Education standards urge teacher programs to address the issue of sex-equity, but very few programs appear to be doing so (Gollnick & Cyr, 1979) Most materials designed for teacher training in sex equity are designed for use with inservice teachers. However, materials have been recently published for use with pre-service teachers as the result of the Women's Educational Equity Act projects and the Non-Sexist Teacher Education Project. Of the most frequently used texts in pre-service teacher education training, ninety-five percent (95%) of the texts devote less than one-percent of their content to issues of sex-equity and many of them actually perpetuate stereotypical attitudes and behaviors (Sadker, Sadker, & Hicks, 1980b). A noteable exception to this is Sadker & Sadker's (1981) new foundation of education text entitled Teachers Make the Difference. Today, women's studies courses are offered in many colleges and universities, although most of the courses are offered in liberal arts departments and few education majors enroll in them (Gollnick & Cyr, 1979). Few descriptions of courses, units, or modules regarding sex-equity taught in education departments can be found in the literature (Gillis, 1981).

When we examine the issue of sex equity in education and sex-fair teaching practices, we need to consider the impact of the women's movement upon society and of Title IX upon education. Have today's pre-service teachers been affected by these factors? What are their attitudes toward women: stereotypical or sex-fair? Do these future teachers need to have their awareness levels heightened?

Research with public school teachers, counselors, and students has documented that exposure and instruction in nonbiased techniques can produce changes in sexist thinking and can increase the use of strategies that are considered sex-fair/sex-affirmative (Griffin, 1982; Grandinetti, 1979; and Woodcock and Herman, 1978). A review of recent literature demonstrated that little research has been published relating to the attitudes of pre-service teachers toward women. Panko (1979) found that the attitudes toward women held by child development majors and education majors were not significantly different from the attitudes of students with other, non-education majors in the ten classes studied. Alden, Seiferth, and Jacko (1980) studied pre-service teachers' attitudes toward men and women. This research indicated that males were more sex-biased than females, and secondary education students were more sex-biased than elementary education students.

The current researchers examined a group of pre-service teachers' attitudes toward the roles of women in society and knowledge about women and the world of work. Four questions were analyzed: 1) How knowledgeable are today's pre-service teachers about women and the world of work? 2) What are the attitudes of today's pre-service teachers toward women's roles in society? 3) Are there differences among majors (i.e., early childhood, elementary, and secondary) in knowledge and attitudes? and 4) Are knowledge and attitudes related?

Subjects

The population chosen for inclusion in this study consisted of ninety undergraduated students enrolled in upper division teacher education courses at Southwest Texas State University. Seventy-

three females and seventeen males voluntarily participated in the study. Thirty respondents were randomly selected from each of the following areas: a) early childhood education b) elementary education and c) secondary education. The majority of students ranged in age from twenty-one years old to twenty-five years old.

Procedure

Students were asked to complete a survey instrument designed to measure attitudes toward the social, educational, and economic roles of women and to test the knowledge base of women and the world of work.

Knowledge about women in the contemporary world of work was measured by a questionnaire entitled Women and the World of Work (Riley-Griffin, 1979). This instrument contains fifteen true and false statements based on information from the U.S. Department of Labor Women's Bureau. The following statements are samples from this questionnaire:

"In predominately female occupations, women occupy the majority of supervisory positions."

"The largest group of working women in this country are single."

Respondents received a knowledge score from 0 to 15 based upon the number of correct responses.

Attitudes toward the roles of women were measured by the questionnaire entitled Attitudes Toward the Social, Educational, and Economic Roles of Women (Arnold, 1975). This instrument contains thirty-five statements reflecting traditional and nontraditional roles of women. The following are sample statements:

"Women are willing to give the necessary time to their work."

"Women seem to be inherently less capable than men of logical and scientific thinking."

"Women should be allowed to retain their maiden names after marriage if they so desire."

The respondents were asked to indicate their level of agreement or disagreement with each item on a 5 point Likert scale. Possible scores ranged from 35 to 175 with the higher scores indicating more agreement with non-traditional roles. For the purposes of this study, score ranges indicated the following: a) 35 to 69 - strong agreement with statements based on traditional stereotypical roles of women and strong disagreement with non-traditional statements; b) 70 to 104 - moderate agreement with statements based on stereotypical roles and moderate disagreement with non-traditional, sex-fair statements; c) 106 to 139 - moderate disagreement with stereotypical statements and moderate agreement with non-traditional, sex-fair statements and d) 140 to 175 - strong disagreement with stereotypical statements and strong agreement with non-traditional, sex-fair statements.

Results and Conclusions

Pre-service teachers involved in this study obtained an average score of 9.86 or sixty-six percent (66%) on the knowledge section of the survey instrument, indicating some knowledge regarding women's roles in the world of work. Scores did range from a low of three (3) to a high of fifteen (15). Oneway analysis of variance indicated no significant difference between early childhood, elementary, and secondary education majors on the knowledge scale (See Table 2).

Scores on the attitude section of the survey instrument indicated moderate disagreement with stereotypical statements and moderate agreement with non-traditional, sex-fair statements. The average score on this section was 134.56 with a range between 91 and 165. One-way analysis of variance revealed no significant difference between early childhood, elementary, and secondary education majors regarding attitudes toward the roles of women. (See Table 3). In a similiar study Sieferth, Alden & Jacko (1980) found differences between elementary and secondary pre-service teachers and between males and females. The current researchers did not examine male and female differences due to the relatively limited number of male participants in this study.

Additionally, possible significant correlations were examined between knowledge and attitudes of the respondents among the three groups. The results indicated a .30 for early childhood; .38 for elementary; and .37 for secondary education pre-service teachers. These correlations are summarized in Table 1. There was a moderate positive relationship between knowledge and attitudes for each of the groups. The coefficient of determination (Table 1) also indicated that little of the variance in attitudes can be predicted by the level of knowledge.

The results of this study indicate that the pre-service teachers included in the sample population were moderately knowledgeable about women and the world of work and moderately accepting of non-traditional, sex-fair roles for women. This study also demonstrated that there was not a significant difference in responses based upon pre-service teachers chosen education major.

Therefore, it can be determined that today's pre-service teachers are fairly aware of the work world and are beginning to accept non-traditional roles for women. The results of this study also indicate the importance of continued exposure of pre-service teachers to sex-equity issues.

Recommendations

Sex-equity should continue to be a major goal of the educational profession. Research has shown that teachers do make a difference. Therefore, teacher educators responsible for future generations of teachers, have a major responsibility in helping to meet this goal.

Teacher educators need to understand the effect of attitudes held by pre-service teachers on later classroom behavior and interactions with students. Teachers' beliefs can promote a sex-fair learning environment or perpetuate traditional stereotypes that often limit student potential.

Teacher educators should focus attention on assisting future teachers in becoming aware of sex-role attitudes and the subsequent impact these attitudes have on students' achievement aspirations and career and life choices. Teacher educators need to teach pre-service teachers creative ways to eliminate bias and to produce a sex-fair learning environment designed to help students reach their fullest potential.

NCATE standards and requirements urge teacher education programs to focus attention on sex-equity issues with pre-service teachers. Recently, a few materials have been designed for use with pre-service teachers and teacher educators need to make a commitment to the task of training non-sexist teachers.

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TABLE I

PRODUCT MOMENT CORRELATIONS BETWEEN ATTITUDES AND KNOWLEDGE

Group	Knowledge		Attitudes		r_{xy}	r^2_{xy}
	X	SD	X	SD		
Early Childhood	10.78	2.53	138.56	12.14	.30	.09
Elementary	9.47	2.69	134.30	16.60	.38	.14
Secondary	9.33	2.20	129.83	18.62	.37	.14

TABLE 2

ANALYSIS OF VARIANCE FOR KNOWLEDGE

Source	SS	df	MS	F
Between groups	37.62	2	18.81	3.05 (NS)
Within groups	535.5	87	6.16	
TOTAL	573.12	89		

TABLE 3

ANALYSIS OF VARIANCE FOR ATTITUDE

Source	SS	df	MS	F
Between groups	1144.3	2	572.15	2.23 (NS)
Within groups	22315.8	87	256.5	
TOTAL	23460.1	89		

SEX DIFFERENCES IN CHILDREN'S NONVERBAL BEHAVIORS AND SKILLS

by

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For years, research in the area of children's communicative behaviors has focused on verbal abilities. One widely-held notion that has emerged from this literature is that females are verbally superior to males, especially in verbal fluency (Bardwick, 1971). Interestingly as psycholinguists are now reporting little evidence of clear-cut sex differences in verbal abilities, investigators in the "other" area of communicative research - nonverbal communication - are finding strong and consistent sex differences in nonverbal skills. The purpose of this paper is to describe these sex differences, and to examine their implications for children's developing communicative and social skills.

While social psychologists have studied it for years, nonverbal communication has received very little attention in the developmental literature. Instead, developmental psychologists have focused on speech, and relied on linguistic and cognitive models in studying communication skills. The inattention to the role of nonverbal behavior in children's conversations is surprising for several reasons. First, as every parent knows, communication takes place long before a toddler begins to talk. This is dramatically evident in an infant's nonverbal behaviors: eye contact with the caregiver is alternated with looking and pointing toward a desired object, this ritual continuing until the caregiver "gets the message". Secondly, even after they develop language skills, preschool children continue to rely heavily on non-linguistic cues, such as the direction in which a speaker is looking, in trying to comprehend the meaning of an utterance (Cromer, 1976). Cook-Gumperz (1977) refers to non-linguistic cues as "backround) channels of meaning for adults, who usually rely more on the "foregrounded" semantic-syntactic channels. For children, however, the nonverbal channels may be equal to or even more important than language in communicative interactions.

Social psychologists have long been interested in the role of nonverbal behavior in adults' conversational interactions. There is a large body of research that indicates the importance of looking behaviors in regulating turn-exchanges and in affiliative functions during face-to-face interactions. For example, Duncan & Fiske (1977) and Kendon (1967) have found that changes in gaze direction at the beginning and ending of utterances play an important role in turn-signalling during adults' conversations. Speakers look at their partners at the end of an utterance, and look away at the beginning of their turns. Looking at the other at a transition place, such as the end of an utterance, is thought to function as a signal that the other may now have the speaker's turn (Duncan & Fiske, 1977).

Looking behaviors are also related to the impressions formed about another. For example, experimental studies of adults' and children's interactions, such as those by Argyle & Dean (1965), Exline & Winters (1965) and Cantor & Gelfand (1977), have found that looking and liking are related: the length of an individual's gaze correlates significantly with positive evaluations by another. Sex differences have consistently been found in analyses of adult's looking behaviors, with females in both the speaker and listener roles looking longer at their partners, and engaging in significantly longer durations of mutual gaze than do males (e.g., Argyle & Ingham, 1972; Exline, Gray & Schuette, 1965; Kendon & Cook, 1969).

Studies of children's nonverbal behaviors have found sex differences consistent with those reported in the adult literature. For example, research has found that female newborns and preschoolers spent significantly more time engaged in eye contact with adult experimenters than did males (Hittelman & Dickes, 1979; Vlietstra & Manske, 1981). Stoddart (1980, 1981) found that four-year-old females looked at each other more while speaking and listening, and had more frequent and longer durations of mutual gaze than did males. Simlarly, Levine & Sutton-Smith (1973) found that elementary and high school-aged females engaged in more mutual gaze than did males.

Given the various functions of looking behaviors in conversations, sex differences in these behaviors may have important implications for the ways in which males and females structure their conversations. For example, Duncan & Fiske (1977) found that sex differences in adult speakers' looking behaviors were related to length of speaking turns, such that females looked longer, and talked less, then males per speaking turn. Stoddart (1980, 1981) found that sex differences in preschool children's mutual gaze were related to length of conversation: female dyads had more frequent and longer durations of mutual gaze, and engaged in longer conversations than did males. Interestingly, the probability of mutual gaze was positively correlated with and predictive of length of children's conversations.

These results suggest that females' greater visual involvement during conversations facilitates speaker-turn changes and contributes to the ability to carry on conversations. By looking at the other, females may be more sensitive to turn signal indicating that their partner would like to speak, and feedback regarding whether or not they are being understood. Future research will need to examine whether or not females' looks at their partners occur at transition-relevant boundaries whether they are more likely to respond to a request to yield the floor than are males, etc.

Psychologists have offered a number of interpretations of females' greater visual involvement during conversations. Some of the interpretations are that females have a higher need for affiliation and affectionate interpersonal relations (Exline et al., 1965) and are more dependent on visual feedback than are males (Kendon, 1967). On the other hand, females may be more skilled than males in signalling their willingness to engage in reciprocal interactions than are males. This interpretation is consistent with the positive value attributed to looking (i.e., longer looks are interpreted as a sign of one's interest in another), and visual behavior's reciprocal nature (i.e., longer looks by one person tend to be followed by longer looks by the other.)

The notion of skills in nonverbal communication is a relatively recent one. Hall (1979) includes nonverbal skills in her description of social communicative abilities, defined as "abilities that aid the exchange of information through spoken language or through visual, spatial, tactile, or even olfactory cues" (p. 33). Two skills that are important in the exchange of nonverbally-communicated information are accuracy in decoding (judging) and encoding (conveying) nonverbal cues. For example, the ability to decode a conversational partner's signal for a speaking turn contributes to the smoothness of the speaker-turn exchange and reduces the likelihood of being interrupted (Duncan & Fiske, 1977). Similarly, the ability to convey a positive attitude to another through nonverbal cues contributes to the emotional tone of the interaction.

Skills in decoding and encoding nonverbal cues may be especially important with respect to the latter. We use language to communicate what we are thinking; nonverbal channels, on the other hand, provide information about our feelings in the immediate interpersonal environment. In fact, Argyle, Salter, Nicholson, Williams, & Burgess (1970) compared the roles of nonverbal and verbal cues and found that nonverbal cues were four times more powerful than the verbal cues they were combined with in communicating interpersonal attitudes. There is also evidence that our reliance on nonverbal cues for affective information, termed "video primacy", increases with age (Zuckerman, Blanck, Depaulo, & Rosenthal, 1980).

Abilities related to nonverbal communication acquire additional significance when we consider the way in which an interaction's emotional climate structures our experience of others and the interaction as a whole. For example, research has found that our overall evaluations of others are shaped and dominated by the degree to which we experience them as positive or negative, friendly or hostile, etc. (Osgood, Suci, & Tannenbaum, 1957). Thus, skills in conveying and interpreting nonverbal cues of friendliness, pleasantness, etc., may play a central role in our ability to establish good interpersonal relations.

Experimental studies of decoding skills have examined subjects' ability to accurately judge nonverbal expressive stimuli that consist of face, body, and/or vocal cues, presented in photos, drawings, videotapes, or recorded speech. In testing sensitivity to vocal cues, the actual speech content is either distorted or removed, so that the voice tone is left as the only cue. Subjects are typically asked to select from a number of alternatives the name of the emotion or interpersonal situation represented. In studying encoding skills, researchers present subjects with emotion-provoking stimuli and record either their spontaneous or posed responses (Hall, 1978).

Research concerning nonverbal decoding and encoding skills has increased dramatically in recent years. Psychologists have been especially interested in sex differences in these skills, since women are generally considered more intuitive, interpersonally sensitive, and other-oriented than males. Researchers in this area have consistenly found that females are superior to males in both decoding and encoding skills, with females' advantage greater for visual than auditory (voice tone) cues. (See Hall, 1978, 1979 for quantitative summaries of this research.) Skill in decoding and encoding nonverbal cues increases linearly with age during the preschool and elementary-school years until it levels off in young adulthood (Rosenthal, Hall, DiMatteo, Rogers, & Archer, 1979; Zuckerman et al., 1980). Sex differences have been reported in all age groups studied, with no significant differences in the size of females' relative advantage (e.g., Dimitrovsky. 1964; Rosenthal et al., 1979). However, there are so few studies involving young children, particularly studies involving young children, particularly studies of encoding skills, that statements about sex differences in this age group are only tentative.

Several explanations have been offered to account for sex differences in encoding and decoding skills. One explanation concerns gender role stereotypes, i.e., personality characteristics and behaviors considered appropriate for each sex. According to this explanation, females are more skilled in nonverbal behaviors because the feminine gender role encourages interpersonal sensitivity and expressiveness (Broverman, Vogel, Broverman, Clarkson, & Rosenkrantz, 1972). If this account is true, greater 'femininity' in females and males should be positively related to decoding skills. However, studies which have correlated decoding abilities with masculinity-femininity have found small and insignificant within-sex correlations, thus providing no support for this hypothesis (Hall & Halberstadt, 1981).

On the other hand, there is some evidence that gender roles are related to sex differences in encoding skills. Zuckerman, De Frank, Spiegel, & Larrance (1982) hypothesized that the active expression of nonverbal cues, rather than the decoding of those cues, was reinforced for the feminine but not the masculine sex role. This hypothesis was supported by their findings of a significant positive correlation between college undergraduates' accuracy in encoding nonverbal cues and measures of femininity. Indirect support for this hypothesis comes from a study by Fujita, Harper, & Wiens (1980), who found that adult females were superior encoders, especially when reacting spontaneously to stimulus slides. Interestingly, there was little difference in males' and females' encoding when they were asked to enact emotional expressions. The authors argue that the sex differences in the spontaneous condition probably reflect the operation of different "display rules" for males' and females' nonverbal behavior, i.e., males learn to hide their feelings while females are encouraged to express them.

There is no published research concerning the relationship between children's nonverbal encoding skills and gender roles. However, two studies which examined the development of preschool children's encoding skills found that while girls' encoding accuracy increased significantly between three and six years of age, boys' encoding accuracy significantly decreased (Buck, 1977; Zuckerman & Przewuzman, 1979). These findings are particularly interesting because this is the developmental period in which children establish sex-role identifications. Further research is needed to determine the ways in which sex-role socialization contributes to the development of sex differences in nonverbal encoding skills.

Another issue that can be raised with respect to sex differences in nonverbal skills is their implications for face-to-face interactions. First, as noted earlier, nonverbal cues play important roles in regulating the flow of conversations and in providing feedback. Females' skills in nonverbal decoding and encoding may make them more sensitive to conversational turn-signals. These skills may also contribute to the development of sex differences in verbal fluency. For example, since females look more at each other during conversations, they have multiple channels of available to them simultaneously. Skills in encoding in the nonverbal channels may allow speakers to speed up their delivery, and use fewer words to convey meaning (since meaning is conveyed nonverbally as well as verbally).

Sex differences in nonverbal skills may also be related to differences reported in males' and females' styles of speech. For example, the fact that females look more at conversational partners and are more nonverbally skilled may contribute to the perception that females are more polite and/or less direct in their speech than are males (e.g., Henley, 1973-4). Examples of females' indirectness includes the use of tag questions, indirect requests, qualifiers, etc. Although the data are equivocal on this point (e.g., Stoddart (1980) reported no sex differences in children's use of direct versus indirect requests for action), females' speech may be interpreted as more polite since it is accompanied by positive nonverbal behaviors. At the time time, since females look more at others, they may be more conscious of the impact of different speech styles, and use these in conjunction with nonverbal behaviors as communicative strategies.

Finally, sex differences in nonverbal behaviors and decoding and encoding skills may have implications for the development of social skills and interpersonal adjustment. As discussed in an earlier section, skills in decoding and encoding nonverbal cues contribute to our experiences of others as friendly or hostile, positive or negative, etc. This will in turn influence whether or not we choose to interact with them. For example, research on children's social behavior has found that friendly initiations are reciprocated and lead to friendly, sustained interactions. On the other hand, children either ignore or respond in kind to demanding initiations (Hartup, 1970; Leiter, 1977).

Several studies have found evidence of a positive relationship between nonverbal encoding and decoding skills and social adjustment. For example, Buck (1975) found that preschoolers who were skilled in nonverbal encoding were rated by teachers as more direct in their emotional expressiveness and as having more friends. Zuckerman & Przewuzman (1979) reported that preschoolers high in encoding and decoding abilities were rated by teachers as being better adjusted to school. Finally Izard (1971) found that decoding abilities in children ages two - eleven years correlated positively with social adjustment and conceptual motor development.

While none of the above studies reported finding sex differences in measures of social skills or social adjustment, there is evidence that boys have higher rates of behavior problems, particularl conduct problems, and proportionately more learning disabilities than girls (Quay & Werry, 1972). The fact that males are generally less skilled than femlaes in decoding and encoding nonverbal cue may contribute to their higher rates of behavior problems. For example, a child who is insensitiv to nonverbal cues about other's feelings and intentions, and is unclear in communicating his or he own may be rejected by peers and adults alike.

There is evidence that peer and adult acceptance or rejection is functionally related to children's nonverbal skills. For example, Ladd (1979) found that third-grade children's peer popularity increased after training in social skills which included positive nonverbal behaviors. And Cantor & Gelfand (1977) found that children who looked and smiled at adults, and asked questions, were rated as more attractive, intelligent, and easier to work with than were less responsive children. Also, adults attended more to responsive children, and responded more frequently to their requests for help with a task. The difference in ratings were not a function of actual differences in children, since the same children served in both experimental conditions. In light of these findings, psychologists should carefully evalute the impact of nonverbal skills training for children, especially boys, who are at-risk for developing behavior problems.

Several important questions remain for researchers concerned with the implications of sex differences in nonverbal skills for children's communicative and social competence. First, how important are nonverbal decoding and encoding skills to children's interpersonal adjustment? And to what extent will training in these skills increase social competence? Secondly, what is the relationship between nonverbal and verbal social skills? To what extent do females' greater visual attention to others, and decoding and encoding skills contribute to their greater verbal fluency in conversations, and communicative strategies, e.g., polite speech styles? Finally, what factors positively or negatively affect the development of decoding and encoding skills for nonverbal cues, and sex differences in these skills?

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UNDERSTANDING GIRL TALK AND BOY TALK

by

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"Damn you! I hate you!" shouted Billy trying to hold back his tears as he ran from the third grade classroom. Mrs. Hanson was angered both by Billy's language and his conduct. She didn't realize that this outburst occurred because she was the most important person in his life.

Billy, who lived in a foster home, received adequate care but little affection. He viewed Mrs. Hanson as the most significant person in his life and enjoyed the attention he usually received from her. This morning, for the first time in his memory, he had been given a new shirt and pants which he wore to school. He could hardly wait for Mrs. Hanson's reaction to his new clothes, but she made no comment about them. Then, when she had wrongly accused him of talking, he could contain his hurt and frustration no longer.

This anecdote demonstrates a common dilemma in the classroom. In pupil and teacher dialogues the words may be heard, but the meanings are not always understood. The words Billy spoke did not communicate his message which was, "I love you but my feelings are hurt because you ignored by new clothes and then scolded me for something I didn't do." Had his teacher perceived the true meaning of his message, her response would not have been one of anger.

The purpose of this article is to explore an area of language that has recently been identified as a possible course of ambiguity in communication - sex differences in languages. Since it is not considered masculine for males in our society to cry or to express verbally that their feelings are hurt, Billy was forced to express his hurt through anger. If Mrs. Hanson had been aware of this particular sex difference in language, she might have understood better what Billy was trying to communicate.

The literature suggests that there are specific characteristics that can be used to distinguish male language from female language. A recent study by Fillmer and Haswell* found that pupils in grades one through five can distinguish accurately the following characteristics: conceptual constraints, propriety, tag questions and concepts of occupational roles.

Sex Differences in Language

Conceptual Constraints

Perhaps the most obvious difference between male and female language is the presence or absence of aggression. Children are reared in our society to believe that girls are "polite and proper," but boys are "rough and aggressive." The corresponding language development reflects this conceptual constraint. Society accepts verbal and physical displays of temper from a male, but discourages similar tirades from a woman. Women are allowed to cry and express hurt feelings, fear and other "weak" emotions. On the other hand, it is not appropriate for men to cry or express fear and hurt. Consequently, men must resort to expressions of anger to communicate a wide variety of feelings.

Classroom Implications. The presence or absence of conceptual constraints in pupils' language may be responsible for the following ambiguities in communication.

Listeners may misinterpret overt displays of temper by a male classmate or teacher. They may respond in kind to a call for help from boys like Billy, who disguise hurt feelings in angry language.

Boys may dominate both the teacher's time and the learning activity through aggressive expression of a need for help or a lack of interest. On the other hand, girls may suffer a lack of attention because their concerns or complaints are expressed in constrained language. In the classroom as well as in the garage, the squeakiest wheel gets the grease even though all the wheels are in need

Teachers can learn to recognize the different conceptual constraints under which boys and girls communicate and can learn to understand the meaning behind the words. Then teachers can teach boys and girls about this aspect of language difference. Both boys and girls can learn the difference between aggressive and assertive language and strive to communicate assertively when appropriate without being aggressive. By the same token, boys and girls can learn to express emotions of hurt and fear in a manner comfortable to them without necessarily resorting to aggressiv

anger or dissolving into tears.

Propriety

A special type of conceptual constraint is related to propriety in language. Early in life most boys learn from role models to use bawdy language in telling jokes, expressing anger and in other situations in which expletives seem to be in order. In contrast, girls are taught to use euphemisms for certain parts of the body or specific bodily functions. In addition, it is not generally accepted for girls to use cursing or slang.

Classroom Implications. In the classroom boys tend to use "gutsy", vigorous language sometimes including epithets and/or cursing in comparison to the more refined, sometimes veiled expressions of girls. This sex difference can lead to the same ambiguities in communication previously discussed under the category of conceptual constraints.

Tag Questions

A characteristic of female language that may be related to the issue of conceptual constraints is the use of tag questions. A tag question is less assertive than a direct statement but more confident than a question. Some linguists theorize that the same feelings which cause women to avoid aggressive or coarse language cause them to avoid making outright statements. It may be more comfortable for them to suggest an ideas in a tag question and allow a male or someone in authority to confirm it: A whale is a mammal, isn't it?

Classroom Implications. Basically the ambiguity of communication caused by the female tendency to ask tag questions is that teachers may believe that girls asking the tag questions do not understand the concepts under discussion. Actually, these girls may understand the material better than the boys who are making definite statements. In responding to a tag question, teachers may want to probe further to determine the extent of the pupil's knowledge.

Teachers can make girls aware of the fact that tag questions imply uncertainty or lack of understanding. By consistenly using tag questions girls run the risk of having people believe that they are not in command of the facts. In learning to use statements rather than tag questions girls can project themselves as being better informed.

Occupational Roles

Of all the characteristics distinguishing male and female language perhaps occupational roles have been the most publicized. Much research points out that until recently, women were relegated to the occupational roles of nurse, secretary, teacher and mother in the bulk of school literature. Most other professors, such as doctor, dentist, lawyer or engineer were relegated to men. The pronoun he is still used to refer to an unspecified person regardless of sex. The literature also talks about "the man on the street," "mankind" and "our founding fathers".

Classroom Implications. Teachers can select materials and structure classroom discussions so that girls realize their occupational choices go beyond those of nurse, teacher or secretary. Boys should realize that their occupational choices may include nursing, child care, food services and other occupations traditionally relegated to women. Beliefs about occupational roles are derived partially from beliefs about appropriate activities learned early in life. Consequently, teachers can encourage girls to participate in classroom activities that have been given to boys in the past, such as threading the movie projector. Boys can share in housekeeping types of activities, such as washing the chalkboards.

Conclusion

Since research indicates that pupils in the elementary grades do recognize specific sex differences in our language, it is appropriate to provide for direct teaching of these differences in the language arts curriculum. Such an addition to the curriculum should result in more effective communication both among pupils and adults.

Direct teaching of stereotypic expressions can lead pupils to a deliberate and reflective understanding of sex differences in language and enable them to deal with these differences on a conscious level. Dealing with these differences on a conscious level involves not only understanding but may also lead to a change in language usage. For example, boys may find a more appropriate vehicle for expressing hurt and frustration and girls may become more comfortable using definitive language.

Once children learn to deal with language differences on a conscious level - whether they be sex differences, dialect differences or regional differences - they better understand the speaker's intent. Such understanding is the basis for effective communication.